

THE CURE OF MASTERS AND SICKS

To the right W^{or}full Sir I O H N P A L T O N
Knight, Gouernour of his maiesties Isle of Iersey, I.T.
wisheth worlds pleasure and heauens happiness.



HE Bee (right Worshipfull) by serious industry gathering a certaine hidden vertue from sundry sortes of Flowers and Hearbes, and making thereof (by labour and trauell) a materiall Lumpe, namely the Hony combe : is not therefore to be condemned by any, but rather commended of all. The Physician of many simples making one compound medicine, doth nor onely thereby reape profit to himselfe, but applauditie to others : And the studious Reader, out of many Authors select some chiefe principles which hee recordeth as memorials, eyther to profit himselfe, or to pleasure others.

Of these two comparisons, the first is excellent for imitation in generall : the second very necessary for diuers in particular : and the last (though not so highly esteemed of the common sort of people, by reason of their ignorance in Arts and Sciences, yet for the good that may come thereby to a Common wealth) nothing inferiour to the best : especially, where their study tendeth to good and vertuous exercises, or the practise and contemplation thereof to laudable Arts and Sciences. Of which Arts, namely Mathematicall, Nauigation being a principall member, as also participation in Arithmeticke, Geometry, Geography, Cosmography, & Astronomy, or rather to say the truth, being the quantitie of them all, yea the proofe and triall of them : for albeit a man reade or heare never so much of Cosmography, or Astronomy, yet without practise and experience it is vnperfect: and how can perfection be attayned, but by sayling, and transporting from place to place, thereby beholding the diuersitie of dayes and nights, with the temperature of the Ayre in sundry Regions, whereby the

450

Dsp. Messrs Room
A.I.



George Johnston

Durisut Barker
1899.



RB23. a 10742

(1-6)

1841
1630
—
211

To the right W^Worfull Sir I O H N P A L T O N
Knight, Gouernour of his Maiesties Isle of Jersey, I. T.
wisheth worlds pleasure and heauens happiness.



HE Bee (right Worshipfull) by serious industry gathering a certaine hidden vertue from sundry sortes of Flowers and Hearbes, and making thereof (by labour and trauell) a materiall Lump, namely the Honey combe : is not therefore to be condemned by any, but rather commended of all. The Physician of many simples making one compound medicine, doth not onely thereby reape profit to himselfe, but applauditie to others : And the studious Reader , out of many Authors select some chiefe principles which hee recordeth as memorials, eyther to profit himselfe, or to pleasure others.

Of these two comparisons, the first is excellent for imitation in generall : the second very necessary for diuers in particular : and the last (though not so highly esteemed of the common sort of people, by reason of their ignorance in Arts and Sciences, yet for the good that may come thereby to a Common wealth) nothing inferiour to the best : especially , where their study tendeth to good and vertuous exercises , or the practise and contemplation thereof to laudable Arts and Sciences. Of which Arts , naturally Mathematicall , Nauigation being a principall member, as also participation in Arithmeticke, Geometry, Geography, Cosmography, & Astronomy, or rather to say the truth, being the summe of them all, yea the proofe and triall of them : for albeit a man reade or heare never so much of Cosmography, or Astronomy, yet without practise and experience it is vnperfect: and how can perfection be attayned, but by sayling, and transporting from place to place, thereby beholding the diuersitie of dayes and nights, with the temperature of the Ayre in sundry Regions , whereby the

The Epistle Dedicatory.

who's oarſe and regulation of the Sphære is made apparent to Mans capacitie? And by what meanes can Sayling be performed, but by Nauigation? Which ſo being, it may be affirmed that as the Mathematicall Sciences are the grounds of Nauigation, ſo is Nauigation the onely meanes, whereby the excellencie of thofe Arts and Sciences, are proued ar' lay'd open to the view of the World. Therefore very aptly may Arts be tearemed, The mirror of Nature; because that by Artes, the wonderfull and hidden ſecrets of Nature are reuealed; and Nauigation may be called, The tryall of Arts, being that thereby the whole ſtudy of Arts is proued to bee true. The reaſons moouing mee, as alſo being many times conuerſant with Sea-men and Mariners, whereby I perceiued what they (I meane the common and plainer ſort of them) chiefly desired: at my beſt leſure I made a collection of ſuch Tables and Rules, as I thought fitteſt for their purpoſes: and being iſtantly vrged by diuers to publish them, althoſh I was very loath to aduenture my ſimple labours to the common view of carping Cenſurers: Yet at laſt (hoping well for the beſt, and not greatly reſpecting the worſt) I reſoluēd to hazard my Paſters to the Preſſe, and (as the common cuſtome of the world is) thinking vpon a Patron, to protect it from the malicious flanders of malignant ſpirits, I preſumed vpon your Worſhips fauour in two reſpects: The one in conſideration, that your ſelfe being ſo well acquainted in the Artes Mathematicall, would (thoſh not in reſpect of the Author, yet for affection to the matter) vouchſafe the protection of them: The other, that being in duty bound to be at your Worſhips pleaſure, I know not how I might ſhew my ſelfe dutifully affected, better then by dedi‐cating my (thoſh vnpoliſht yet well-willing) labours to your fauourable diſposing, beſeeching your Worſhip to accept of them, and to pardon my boldneſſe; And ſo with my daily prayers to God for your health and proſperous ſuccesse in all your actions, I reſt:

*Your Worſhips moſt dutifully
to be commanded,*

JOHN TAP.





TO THE COVRTEOVVS *Readers Health.*



Entle and indifferent Readers, whose judgements are not so Sophistically mixed with humorous conceits, and quipping quidities, (as many are now a dayes) who are apter with their turbulent tongues to condemne all things, then with sensible judgements to amend any thing: as for them or any such Carping Zoylists, I am indifferently perswaded to set as lightly by their partiall and injudicall censures, as they are farre from hauing a good opinion of ought but what is agreeable to their owne fantasticall fictions: Onely to them that are of more plausible spirits and grauer judgements, who (for the most part in reading) applaud that which is good, and passe ouer with silence that which is not hurtfull, without scoffing at the werke, or deriding the Author, and to those that hauing small vnderstanding, are desirous of more knowledge in the Art of Nauigation, and other Mathematicall studies: To the one I commit the censuri g of my worke, and to the other the profit of my labours; knowing that the wife will rather winke at small faults, then rashly reprove that which may profit others, though not pleasure themselues. And though (as I say) the curious and expert Mariners finde nothing herein contayned which may satisfie their expectation, yet I hope they will judge fauourably of my intention, and with patience passe it ouer for affection to the Art it selfe, wishing charitably that my skill were answerable to my will. As for the meaneer sort, whose experience haue not beene fitted with Arts Rudiments, nor their judgements fined

To the Reader.

with demonstratiue illustrations in the Mathematicall Sciences, but
only are now (as it were) setting themselves with willing mindes
to learne what they before wanted, I make no question, but as by these
following Tables and Propositions they may recepe profit, so ac-
cordingly, in yeilding friendly censures vpon me and my workes,
they shall answe my expectation, with a full recompence of my pas-
sed labours. Further, I haue added hereunto for the better confirma-
tion of my love vnto the practisers in this Art : I meane such as are
not acquainted with the doctrine of Triangles, the explanation of Ma-
ster *Ralph Handsons* 5. Nauticall Diagramis in his 5. feuerall Cases for
finding the Sunnes Azimuth, by him wrought by the Canon of Tri-
angles in *Pistinus*, and here amplified onely to the abridged Table of
Sines, towards the later end of this Booke. Further intreating the
courteous Readers, to doe me that fauour, as to correct what they shall
find amisse, either in the Printers ouersight, or mine owne error, and
I shall not onely endeavour the mending of them in the next Impressi-
on : but also be very thankfull to them that at any time shall give me
notice thereof, resting withall

Your obliged friend,

JOHN TAP.

The Propositions follow.

To the Reader.

I.

For the Sunnes Azimuth having no Declination.

Adde the Complement of the *Latitude*, to the complement of the *Almicanter*, which if the totall be more then a Quadrant, subtract 90. and set downe the Sine of the remainier for the first number. Againe, adde the complement of the *Latitude* and the *Almicanter*, & addē the sine therof to the former : from the one halfe of that totall subtract your first number or sine, and set downe the remainier. Then

As the $\frac{1}{2}$ of the 2. first numbers added is in proportion to the whole sine, so is the said remainier to the sine of the Sunnes true *Azimuth*.

Example.

Latit. 51.d.30'. the Compl. 38.d.30'. $\frac{1}{2}$ Added makes 108.d.30'. *Almicanter.* 20. d. Complement 70. o. $\frac{1}{2}$ 90. subtracted, leaues 18.deg.30'. whose sine 3173. is the first number. Againe, complement of the *Latitude* 38.deg.30'. *Almicanter.* 20.d.added makes 58.30'. whose sine 8526. is the second number, those 2. numbers added makes 11699. the $\frac{1}{2}$. thereof 5849. from which subtract 3173. the first number reſts 2676. for the remaine : then ſay,

As 5849. the $\frac{1}{2}$ of the 2. first numbers is to 10000. the whole sine, ſo is 2676. the remainier to the *Azimuth* desired.

Facit, 4575. whose arch 27.deg.14'. is the *Azimuth* from the East Southward.

2. When the Sunne bath North Declination, the 2. Complements being equall to a quadrant.

Adde the complement of the *Latitude* with the *Almicanter* only, and from $\frac{1}{2}$. the sine thereof, subtract the sine of the Declination, and ſetting downe the remainier.

As the $\frac{1}{2}$. aforesaid, is to the whole sine, ſo is the remainier aforesaid to the sine of the *Azimuth* desired.

3. When the Sunne bath North Declination, the 2. Complements leſſe then a quadrant.

Adde the complement of the *Latitude*. and the complement of the *Almicanter*. ſetting downe the sine of the complement thereof, *then*

To the Reader.

then adde the *Almicanter* and the complement of the *Latitude*, and from the sine thereof subtract the former, setting downe $\frac{1}{2}$. of the remaine for the first found number: againe, subtract the sine of the first Complement from the sine of the Declination and the remaine therof, againe subtract from your first found number, and set the remaine thereof downe for your second number: and then,

As the first found is to the whole sine, so is the second to the *Azimuth* desired.

4. When the Sunne hath North Declination, and the 2. Complements more then a quadrant.

Adde the Complement of the *Latitude*: and complement of the *Almicanter*, which being more then 90. subtract 90. and set downe the sine of the remainer, then adde *Almicanter* and complement of the *Latitude* and set downe the sine therof, adde both the sines together and take the $\frac{1}{2}$. therof for the first found number, then to the sine of the first 2. complements adde the sine of the Declination, and from that totall subtract the first found, and set downe the remainer for the second found: and then,

As the first found is to the whole sine, so is the second found to the sine of the *Azimuth* desired.

5. When the Sunne hath South Declination, and the 2. Complements more then a quadrant.

Adde the 2. Complements, subtract 90. set downe the sine of the remainer, adde also the *Almicanter*. and complement of *Latit.* adde both their sines and set downe $\frac{1}{2}$. of the totall for the first found, then subtract the sine of the Declination from the sine of the remaine of the first 2. Complements, and that remaine againe from the first found, which last remaine set downe and say,

As the first found is to the whole sine, so is the second found to the sine of the *Azimuth* desired.

It is to shew by what rule to have a certaine
certaine proportion of a circle, if one angle be given
and.

Certaine



Certaine Definitions, meet to bee vnderstood of thofe
that will practise Navigation.



Sphære or Globe, is a round figure, made by the turning of halle a Circle, till it end where it began to be moued; or a massie body inclosed with one platorme or surface: In the middle whereof is a pricke, from which all Limes drawne to the surface are eqmall.

Center, is the point or pricke aforesaid, in the Middle of a Sphære, Globe, or other Circle.

Diameter, is a right Line drawne through the Center, to the Circumference or surface of a Sphære or circle to each side therof.

Circumference, is a round Circle equally distant on all sides from the Center thereof.

Surface or Superficies, is the vpper part of any thing.

A Degree, is the 360. part of a Circumference of any Circle.

A Minute, is the 60. part of a Degree, being vnderstood of meaſure: but in time, a minute is the 60. part of an houre, or the fourth part of a degree, i 5. degrees answering to an houre, and 4. minutes to a degree.

The Pole, is a point or pricke imagined in the heauens whereof are 2. the North Pole being the Center, to a Circle described by the motion of the North Starre, or the tayle of the little Beare: from which poyn̄t aforesaid, a line imagined to passe through the Center of the earth and passeth directly to the opposite part of the heauens, sheweth the South Pole.

The Equinoctiall, is a great Circle, imagined in the heauens also deuiding the Heauens into 2. equall parts, and lying iust in the middle betwēen the two Poles, being in compasse from West to East, 360. degrees, every degree of terrestriall measure, valuing 20. English leagues, or 60. miles.

The Sea-mans Kalender.

The Meridian is a great Circle, deviding the Equinoctiall at right angles into two equall parts, passing also through both the Poles and the Zenith: to which Circle the Sunne comming twice euery 24. houres, maketh the middle of the day, and the middle of the night.

Note that euery place hath a feuerall Meridian, which doe all meet together in the Poles of the world.

Zenith, is a poynt or pricke in the Heauens, right ouer our heads, 90. degrees from the Horizon, as the Pole is 90. degrees from the Equinoctiall.

Nadir, is a poynt or pricke in the heauens vnder our fete, opposite to the Zenith.

Horizon, is a great Circle, deviding that part of the Heauens which we see, from the other part we see not.

Azimuth, is a great Circle, crossing the Horizons at right angles as the Meridians doe the Equinoctiall, being as many as the Meridians: and as the Meridians concurre and meeet togither in the Poles of the world, so doe the Azimuthes meeet in the Zenith, which is the Pole of the Horizon,

Parallels, are Lines or Circles equally distant in all parts one from another, as all Circles of East and West are parallel to the Equinoctiall.

Almicanterahs, are Circles parallel to the Horizon, being also Circles of Altitude or Elevation, being that the Altitude of the Sunne, Moone, or Starres aboue the Horizon are described thereby: which Almicanters doe crosse the Azimuthes, as the Parallels or Circles of East or West doe crosse the Meridians.

The Tropicke, are two lesser circles parallel to the Equinoctiall, limiting the bounds of the Zodiacke or the greatest declination of the Sunne on each side of the Equinoctiall. The Tropicke of Cancer Northward, and the Tropicke of Capricorne Southward, whose distance from the said Equinoctiall are 23. deg. and 31. min.

The Zodiacke, is a great Circle crossing the Equinoctiall in two opposite places thereof and swarling byas-wise therefrom towards eyther of the Poles, touching the Tropicke of Cancer on the North

The Sea-mans Kalender.

North part and the Tropick of Capric. on the South part thereof : In the Zodiacke are 12. Signes : viz. Arie., Tau. Gem. Car. Leo. Virg. Libra. Scorp. Sagit. Capr. Aqu. Pisces, every signe being 30. deg. in length , and 12. in bredth : throught which signes the Sunne passing, describeth a yere, and the Moone passing likewise through the same , makes a Moneth ; the 12. degræs that the Zodiacke hath in bredth, are allowed for the Latitude of the Planets.

Eclipticke , is a Circle lying just in the middle of the Zodiacke, out of which the Sunne never goeth, but the Moone and other Planets are sometime on the one side , and sometime on the other side thereof, in which the head and tayle of the Dragon also is.

The head and tayle of the Dragon , are two opposite points in the Ecliptick line of the Zodiacke , which goeth backward through all the 12. Signes in 19. yeares : And when it hapneth that the Sunne and Moone are in Conjunction , in that place of the Ecliptike where the head or tayle of the Dragon is, then is the Sunne eclipsed, and being in the Oppositions , the Moone being in eyther of the said points , the Moone shall be Eclipsed.

The Circle Articke, is a Circle which incloseth all those starres which doe never rise or set in any latitude , but are always above the Horizon where the North pole is raised : the like is vnderstood of the Circle Antarticke, where the South pole is raysed.

The Polar Circles, are 2. little circles distant from the Poles of the world , so much as is the greatest declination of the Zodiacke from the Equinoctiall : in which Polar Circles are the Poles of the Zodiacke.

Colures, are two great Circles passing throught both the Poles, crossing one another in the said Poles at right angles , and deuiding the Equinoctiall and the Zodiacke into 4. equall parts , making thereby the 4. seasons of the yere. The one Colure passing throught the Equinoctiall poynts of Aries and Libra , sheweth the beginning of the Spring time and Autumne , which 2. times , the dayes and nights are equall. The other Colure passing throught the 2. Tropicall poynts of Cancer and Capricorne sheweth the beginning of the Summer and Winter; at whch 2. times, the dayes and nights are longest and shortest.

The Sea-mans Kalender.

Altitude, in the Heauens, is the height of any thing aboue the Horizon towards the Zenith.

Latitude, is the widenesse or distance of the Planets or Starres from the Ecliptike, either Northward or Southward. Also Latitude is the distance of the Zenith of any place from the Equinoctiall, towards either of the Poles, which is alwaays equall to the height of the Poles of the same place.

Longitude, is length, and in the heauens it is understand the distance of any Starre or Planet, from the beginning of Aries to the place of the said Planet or Starre, or from the beginning of any line to a certaine other part or degree of the same line: Otherwise, longitude in the earth, is the distance of the Meridian of any place, from the Meridian which passeth ouer the Isles of Azores, where the beginning of longitude is said to bee Longitude, is counted vpon the Equinoctiall, and Latitude vpon the Meridian.

Declination, is the declining or distance of the Sunne, Moone, or Starres from the Equinoctiall, and is said to be North or South, according to the Pole towards which it leaneth.

Amplitude, is the distance of the rising and setting of the Sunne, Moone, or Starres, from the true East or West point of the compass vpon the Horizon.

Ascention, is the rising of any Starre, or of any portion of the Ecliptike aboue the Horizon. Right Ascention, is the number of deg. and minutes of the Equinoctiall, which commeth to the Meridian with the Sunne, Moone, Starre, or any portion of the Eclipticke. Oblique Ascention, is the numbers of degrees of the Equinoctiall Starre or any portion of the Eclipticke: in which sort is Oblique Descension also.

Ascentionall difference, is onely the remainder, the one being subtracted or taken from the other.

The Golden number or Prime, is the time of 19. yeeres: in which time the Sunne and Moone make all varietie of their Conjunctions, Oppositions, and other Aspects.

Epart, is the 11. dayes and 6. houres, which are added to the yeare of the Moone, being 354. dayes, to make it equall with the yeare of the Sunne, which consisteth of 365. dayes $\frac{1}{4}$. By the

The Sea-mans Kalender.

the prime, is found out the Epact: and by the Epact is found out the age of the Moon.

The Circle of the Sunne, is the number of 28. because that in 28.yeares all the variety of Dominicall or Sunday Letters and Leape yeares are expired, being that at the 29.yeare the said Circle doth begin againe: the use of the which number is to find out the Dominicall Letter for any years past, present, or to come: Where note, that there is but 7. letters which serue for Sunday letters, viz. A B C D E F G. And albeit, that in the dayes of the week, they procede according to their naturall order of the Alphabet, yet in the yeares they goe backward: As if G. be for one yeare, F. shall be for the next: and when it is Leape yeare (which is every fourth yeare) then is there 2.Letters for the yeare the first seruing from the first of January till St. Mathias day, which is then the 25. of February, and then the other letter takes place, and serues till the end of the yeare.

To find which number of the Sunnes circle, and consequently the Dominicall letter for the yeare proposed to the yeare of our Lord, adde 9. that totall deuide by 28. and that which remaines, is, The Circle of the Sun for that yeare: Then to know the Dominicall letter: note that the 28.yeare the dominicall letter is A, and is the third from the leape yeare: therefore the first to begin withall againe, is GF. because it is another leape yeare, and so counting the 7.letters backward, and every fourth yeare counting 2. letters: that letter vpon which the number of the Sunnes circle ends, shall be the Sunday letter for the yeare proposed.

As for Example

The yeare 1627. adding 9. thereto, it makes 1536. that being deuided by 28. the remainder is 12. the circle of the Sunne: then counting 12. Letters backward according to order till I haue counted 12 places, beginning with GF, thus: 1.G F, 2.E, 3.D, &c. I find that the 12.place ends vpon G, which I conclude to be the Dominicall letter for the yeare aforesaid: and it is the third yeare after leape yeare.

And here is to be noted that the Prime and Dominicall Letter, changes the 1.day of January, and the Epact the 1.day of March.

To

The Sea-mans Kalender.

To finde out the Prime.

Divide the yeare of our Lord by 19. and to that which remai-
neth after the division, adde one : the Product is the Prime number
for all that yeare.

As for example.

I would know the Prime for the yeare 1627. divide 1627. by
19. and you shall haue in the Quotient 8. and after the division
there, rests 12. unto whch if you adde 1. it makes 13. which is
the Prime for that yeare 1627.

To finde out the Epact.

Adde to the Epact of the yeare past 11. and if it passe 30. take
away 30. and the Product is the Epact for all that yeare : but o-
therwise, which is the better way : Imagine three places vpon
your hand, which for example let it be the three joynts of your fin-
gers, and call or name the first joynt 10. the second 20. the third
30. then count the Prime number vpon the 3. joynts aforesaid, and
going ouer them vntill you come to the end of the said Prime num-
ber, marke vpon which your prime ends, and adding the number
of the joynt with the Prime, if they come not to 30. that shall be
the Epact for all that yeare : If they passe 30. take away 30. and
the remainder is the Epact, if it be just 30. then is the Epact e-
quall to the Prime.

As for Example.

The yeare 1627. the Prime is 13. and imagining the first
joynt of my finger to be 10. the second 20. the third 30. I count vp
on the 3. joynts 13, the Prime number, viz. vpon the first joynt I
tell 1. on the second 2. on the third 3. Againe, on the first 4. the se-
cond 5. and so to 13. which is the Prime, ending vpon the first
joynt, which I call 10. therefore adding 10. the number of the first
joynt, makes 23. for the Epact of the yeare 1627. aforesaid.

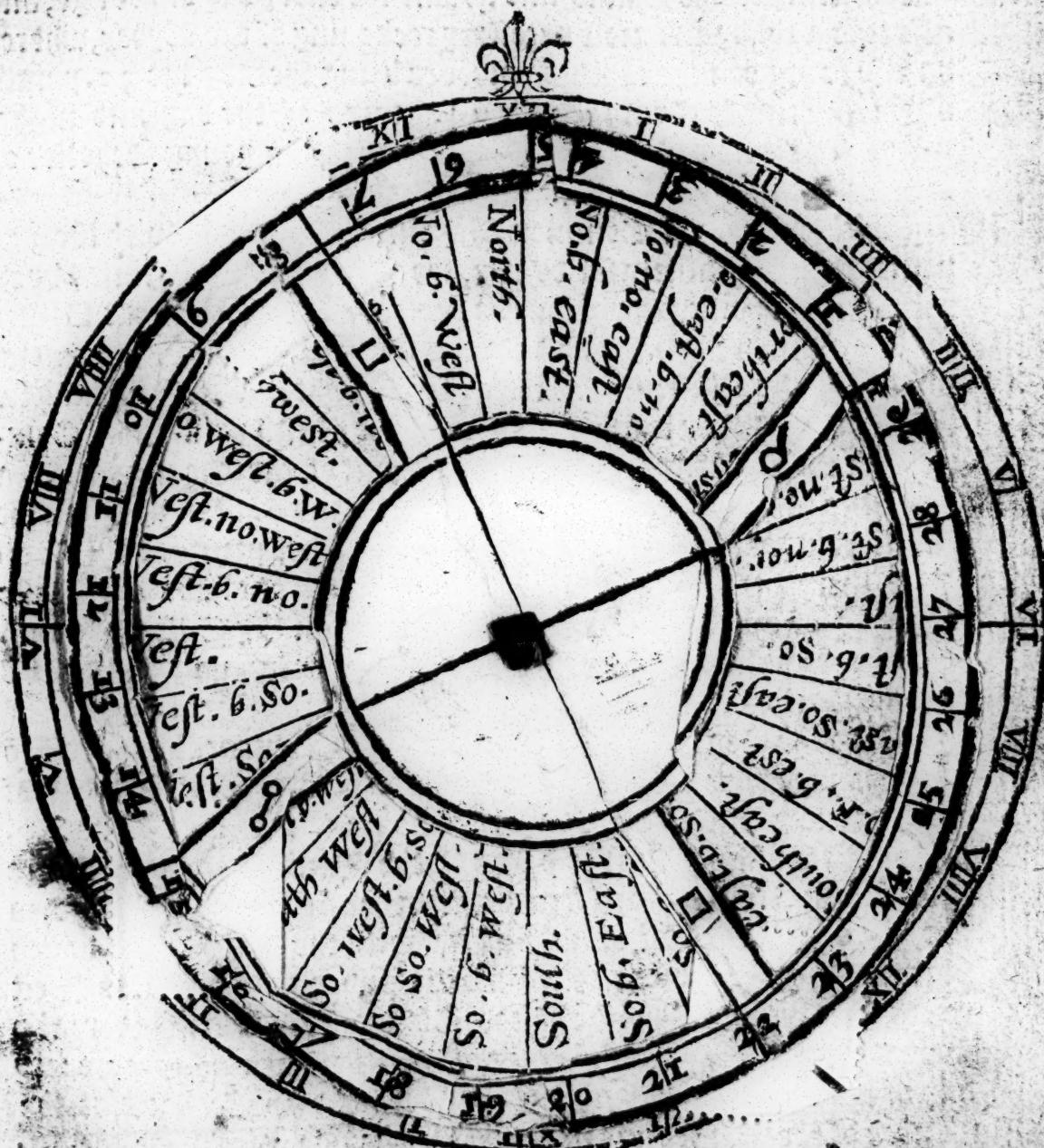
To know the Moones age.

Adde to the day of the Moneth, the Epact, and so many dayes
more as are Moneths from March to the Moneth you are in, in-
cluding both Moneths, and if they come not to 30. so much is the
Moones age : But if they passe 30. take away 30. and the ouerplus
is the Moones age.

This

The Sea-mans Kalender.

This is when the Moneth hath 31. dayes, but if the Moneth hath but 30. dayes, you must take away but 29. and the rest is the age aforesaid, so in those Moneths that haue 31. dayes, the Coniunction is the 30. day of her age, and those Moneths that haue but 30. dayes, the Coniunction is the 29. day of her age.



A Decades

The Sea-mans Kalender.

A Declaration of the former
Instrument.

This Instrument gives you a plaine and easie order, to the shifting of the Sunne and Moone for euery day of her age, and also it is a ready and most necessary reckoning of the Tydes, wherby also is shauen the common order to bring thereby the 32. points of the Marriners Compasse to 24. houres of the day and night, which are the first Rudiments to be learned of a young Scholler or Apprentice in Navigation.

First, here is the Common Marriners Compasse, with the 32. points thereof plainly set downe, the names being Printed vpon each severall point, which must be perfectly learned without Bookes: then is there in the uttermost edge, a Circle diuided into 24. parts which signifie 24. houres of the day and night, where you may see that 12. a Clocke at night, is iust vpon the North point of the Compasse: 12. at Noone vpon the South point of the Compasse: 6. a Clocke in the Morning, vpon the East: and 6. at night, vpon the West point of the Compasse: and for the other points of the Compasse there agreeing with the houres, every point of the Compasse makes $\frac{1}{4}$. of an houre as you see by the North and by East, is vpon $\frac{1}{4}$. of an houre past 12. North Northeast one houre and $\frac{1}{4}$. Northeast and by North 2. houres and $\frac{1}{4}$. and consequently of the rest.

Also to the Center of the Compasse is fixed a moueable Circle to turne round about the sayd Compasse; the uttermost edge whereof moving close within the Circle of houres, is deuided into 29. equall parts, signifying the dayes of the Moones age, which are numbered in Arithmeticall figures, from the first day of her age, to her Coniunction or meeting againe with the Sunne: at which place of her Coniunction, is left a little Idler or Shewer, to direct you to the houres and points of the Compasse: which Idler also shewes you how much the Sunne and Moone are a funder every day of her age, by telling the points of the Compasse betwixt the number of the Moones age in the said moueable Circle and the Idler thereof, accounting every point for 11. degrees, and $\frac{1}{4}$. or other wise

The Sea-mans Kalender.

Astronomers, saith, that as the dayes and nights doe increase or decrease, so must the Planetary hours be longer or shorter accordingly, neuerthelesse, so that there shall be 24. planetary hours in the day and night, aswell as of other hours; but that if the day consist of more then 12. hours, then proportionally the planetary hours to consist of more then 60. minutes: and if the day be lesse then 12. hours, then the planetary hours to be lesse then 60. minutes: and if the day be iust 12. hours, then the planetary hours are equall to the hours of the clockes, and not otherwise. The like is to be vnderstood of the nights: and to make an equality of the planetary hours to them of the clockes, being that how long soever the day is, yet there must be but 12. planetary hours: and how short soever the day is, there must (neuerthelesse) be 12. planetary hours, and so of the night: by which you see that the planetary hours are sometimes greater and sometimes lesser then the common hours of the clockes, which alwayes consist iust of 60. minutes: therefore if you deuide the day into 12. equal parts, one of those parts shall be the quantity of a planetary hour, which you may doe thus: multiply the hours of the day into minutes by 60. & if there be any odde minuts, adde them to the product, the totall being deuided by 12. the quotient shewes the number of minutes contayned in an unequall or planetary hour.

And againe, if at any hour of the day or night you knowe noe what planetary hour it is, that is to say how many planets haue ruled since the beginning of the day or night proposed: multiply the number of the hours past from Sunne rising by 60. and deuide the product by the number of the minutes contayned in an unequall or planetary hour, the quotient will shew you how many hours and minutes of the planets are past from the Sunne rising (if it be in the day) or from Sunne setting, if it be in the night: which knowne, enter the Table, following to know what planet rules the day and hour proposed, looking for the hour desired in that Columnne which is right vnder the day proposed: those planets which are governours of the said hours in the day time, being placed on that side next the left hand, and the governours of the night on the right hand.

B

Example

The Sea-mans Kalender.

Example.

The 18. day of May being Sunday at 9. of the clocke in the morning , I would know what Planet rules : First, in the following Kalender, I finde that the 18. of May the day is 16. hours long : therefore I multiply 16. hours by 60. minutes , and the product is 960. that devided by 12. brings in the quotient 80. minutes for the length of a Planetarye hour at

Gouvernours of the night.	Saturday.	Friday.	Thursday.	Wednesday.	Tuesday.	Munday.	Sunday.	Gouvernors of the day.
								Jupiter.
	I	II	III	IV	V	VI	VII	Mars.
	2	0	10	0	11	1	2	Sol.
	3	0	11	1	12	0	3	Ven.
	4	1	12	2	0	4	5	Merc.
	5	2	0	3	0	5	6	Luna.
	6	3	0	4	1	5	7	Satur.
	7	4	1	5	6	3	8	Iupiter.
	8	5	2	6	7	4	9	Mars.
	9	6	3	7	8	5	10	Sol.
	10	7	4	8	9	6	11	Ven.
	11	8	5	9	10	7	12	Merc.
	12	9	6	10	11	8	13	Luna.
	0	10	7	11	12	9	14	Satur.
	0	11	8	12	13	10	15	

that time : then from 4. of the clocke (the time of the Sunne rising) till 9, a clooke, the hour proposed is 5. hours, which multiplied by 60. brings 300. that devided by 80. (the length of a Planetary hour) brings in the quotient 3. hours and 3. quarters : so I conclude, that at 9. of the clocke, 3. Planets have past their Regiment, and the 4. hath ruled 3. quarters of his hour : therefore under the title Sunday in the top of the Table, I wrote sop 4. toward the side of the said Table, against which on the left hand is placed Luna , therefore I say, that the 18. day of May being Sunday, at 9. of the clocke in the Morning, Luna shall have reigned 3. quarters of her hour.

A Ray.

The Sea-mans Kalender.



*A Rutter, for the Courses round about
Ireland, from Cape to Cape, and what Tydes
it makes in euery Harbour, and how many
Leagues it is from Harbour to
Harbour.*

I ^spriuus, from Cape-cleere to the Mison-head, is 7. leagues, and lyeth West and by North, and East and by South, you shall finde a Haven northwest from Cape-cleere, called Crooke Haven, and it floweth there East Northeast, and West Southwest, you must goe West to enter into it.

From the Misoa to the Durzib, is 7. leagues, and lyeth West northwest, and East southeast.

Beare Haven lyeth from the Mison-head, north northwest 3. leagues and a halfe, you must goe northwest into the Haven, it floweth east northeast and west southwest: if you will anker betwene the Durzib and the maine Land, you must goe aboard the Island, for the east side is not sound.

The 3. Islands that be of the point of the Dowrzes, which is called the Bull, the Cow and the Calfe, they be sound, you may goe within them or else betwene them, for there is no danger but what you see.

Dowrzes, and Blaskey, lye North and by west, and south and by east, and there is betwixt them 1 2. leagues, the Skellocks is betwene both, and it floweth northeast and southwest.

Northeast of the great Skellocks a 2. leagues off, you shall finde the entry of Vallens, you must runne east southeast to enter in, if floweth East northeast, you must borrow of the Island to enter

The Sea-mans Kalender.

in, for the point of the Easter side is long.

North northeast of the great Scellocks, 6. leagues off, you shall finde the Hauen of the Ventry which is a good Road: It floweth East northeast.

N.E. by N. of the great Scellocks, 7. leagues, you shall finde the Hauen of Dingell, and without the Hauen is a Rocke called the Croo, which is sound on both sides: the Rocke doth not couer but on a spring-tyde: you must runne northwest and by west into the Hauen, it floweth east northeast, and south southwest.

The Ventry and the sound of Begue lyeth south by east, and north by west 3. leagues, and when you are past into the sound of Begue, you must lye east and by north in the roade against a red clift which is on the south side.

Southeast of the sound of Blaskey, a 6. leagues off, you shall finde a good harbour named Begue, which is to the Northeast of Valence: The sayd Hauen hath two entries, but to the West side is the best: You must take great heed of a soncke Rocke that is on the Islands side, which you must leave on your Larbore side going in, and it floweth East northeast, and West southwest.

You shall understand, that the sayd sound of Blaskey lyeth southeast and northwest, but you must take heed of a shoald that is on the East side athwart the Sezebras.

From Blaskey to Smerricke is 3. leagues, and if you enter into the Hauen, you must goe southwest into it: It floweth east northeast, and west southwest.

There is a hill to the eastward of Smerricke, which is called Sinbrandon, goe from Smerrick east northeast, and you shall goe with Lopus head, which maketh entry of the River of Limerick, on the north side: there is from one to the other 10. leagues.

Smerricke and the head of the Kerry, lye east northeast and west southwest 7. leagues a sunder, and there is within the Bay thre Islands called Salline.

From Lopshead to the Seatryes is 7. Lea. they lye E.N.E. and W.S.W. and if you enter into the river, take heed of a shold halfe way betwene Lawpshead and an Island called Stratrick, which

The Sea-mans Kalender.

you must leaue on the Southside, and to the Eastward of that Iland is a god roade: It floweth East Northeast, and West Southwest.

From Seatricke to Quine, is 5. leagues, you must goe East, and you shall finde two Ilands, they bee flat Ilands, goe you to the Northwards hard aboord them, and from thence runne East northeast, and you shall finde a Rocke called the Bicffe, goe hard aboord the South side of the said Rocke, called the Bicffe. And when you are at the said Rocke, you must row Southeast, and you shall finde another Rocke called the small Bicffe, then goe with the Iland of the entry of Dorsey, and borow a boord the Iland, as neere as you can, for feare of the banke going into the Hauen, and you must moore at the Castle by foure Cables, for there goeth a great tide, it floweth East northeast, and West southwest.

The Sound of Blaskey, and the Ilands of Arrin, lye North northeast, and South southwest, and there is betwene them 16. leagues: the Ilands lye East and West, and make the entrance of Galloway and the other Ilands: there is one which is naught, but the West sound is good, and the next sound so it is good which is called the little sound, but the sound comming from the East is naught, but the next comming to the Black-shore from the East is partly good, but you must put the two partitions to the Iland, for it is dangerous: You must understand that there is one Iland in the course way, betwixt Lampshred and the entry of Galloway, that hath a great Ramie, a league and a halfe off the maine land.

If you goe before the Towne of Galloway, goe aboord the Black-shore, and bring the Black-shore Southeast of you: then goe Northeast, and you shall fetch the Iland called Motton Iland, and there is betwene them both 3. leagues: You must not truck to the North shorze, for there is a shold halfe way to the Black-shore, and the Iland of Motton, is thwart of two white points, which is on the North side.

The sayd shold is upon the West southwest side of the sayd Iland of Motton, a league & a halfe off al spring tide, then shall you

The Sea-mans Kalender.

it dry, and it floweth at the said Iland, East Northeast, and West Southwest.

The Sound of Saint Gregory, and the Rode of Galue, lyeth East Northeast and West Southwest, and there is betwixt them 8. leagues.

The sound of St. Gregory and Silvis head, lye Southeast and northwest, and the distance betwixt them is 9. leagues.

Slinched and Sarke, lye North by west, and are distant 15. leagues.

Blacke-rocke, is an Iland which is West of Kill-head, a league off the Cape : the said Blacke-rocke and the Stags, lyeth Northeast and by north, and are distant 12. leagues.

From the said Blacke-rocke, runne North, and you shall finde the Iland of East Eies, and there is betweene them 12. leagues.

South southwest off the Stags, there is a Hauen called Broad-hauen, from the Hauen to the Stagges is two leagues : the Stags is a Cape that maketh the entry of the River of Raffen, they lye East and west, and are distant 8. leagues : the Stagges and the Cape of Tellen, lye Northeast and southwest, and are distant 15. leagues.

Betwixt the Stags and the Cape of Tellen, in the Bay, is the Hauen of Moy, the Hauen of Portway, the Hauen of Slego, the Hauen of Ballecshenan, the Hauen of Dongall, the Hauen of Kellekeg, and the Hauen of Tellen.

The Cape of Tellen, and the Iland of Arron, lye North north, east, and South southwest, and are distant 7. leagues.

The Iland of Raghlenburne and Tellen, lye Southwest and Northeast, and are distant two leagues.

The Iland of Raghlenburne, and in the Iland of Torre, lye North northeast, and South southwest, and are distant 14. leagues.

To the Eastward of Torre, is a Cape called Horne-head, and are distant 2. leagues : Southeast of Horne-head is a Hauen called Sheepe-hauen, it floweth East and west, but you shall hane in the Bay a god roade for all winds : the said Hauen is a broad Hauen, and is two leagues from the Cape.

Horne-

The Sea-mans Kalender.

Horne-head and the entry of Loughfoyle, lyeth East Northeast, and West Southwest, and are distant 6. leagues.

The entrie of Loughfoyle; and the Iland of Enerster-houlde, lyeth Northeast and Southwest, and are distant five leagues.

The Iland of Torre, and the Iland of Enersterholde, lyeth East and by North, and West and by South, and are distant 9. Leagues.

The entrie of Loughfoyle, and Enersterholde, Southeast and Northwest and are distant five leagues.

The Iles of Enersterhoulde, and Skirris Portrush, lyeth East Southeast, and West Northwest, and are distant 10. leagues,

You must understand that the River of Loughfoyle lyeth from Skirris Portrush, West Southwest, and East Northeast, and there is betwixt them, the River of the Band: there is betwixt Portrush and Loughfoyle, 5. leagues: There is in the entry of Loughfoyle, a sand which is called the Tonnes, which is dangerous for any Ship of charge, also there is a channell of the East side of the Tonnes, hard abord the shore, but you must haue your tide: It floweth East by South, and West by North: Skirris Portrush and it lyeth South and North, and are distant 12. leagues.

Skirris Portrush, and the Islands of Raghlins, lyeth Northeast and by East, and Southwest by West, and are distant 5. leagues: it floweth in Skirris East Southeast, and West Northwest, the flood commeth from the Eastward.

Off the Raghlins, is a Cape called the faire Forland, and betwixt them is a league and a halfe, the faire Forland and the Knee lyeth Southwest, and Northwest, and are distant 9. leagues.

The faire Forland and Loughrian in Scotland, lyeth East South-east, and West Northwest, and are distant 15. leagues.

There is betwixt the Knee and Carickvergus, 5. leagues.

The point of Loughrian, and the Islands of Cominoras, off Scotland lyeth North and South, you must passe by Elliso, and by the Haven of Lambach a sunder 7. leagues.

The Sea-mans Kalender.

The point of Loughrian and Companie Iles, lyeth Northeast, and Southwest.

The Knee and the rocke of the Maydens, lye Northeast by North.

The Knee and Ellse in Scotland, lye Northeast by East, distant 10. leagues.

Loughrian in Scotland, and the mould of Galue, lyeth South Southeast, and North northwest, and are distant 7. leagues.

The Gould of Galue, and the Caisse of Man, lye South southeast, and North northwest, and are distant 10. leagues.

The Companie Iles, and the roade Carricke Vergus lyg East and West, and are distant 14. leagues, it floweth in the sound East southeast, and West northwest.

Companie Iles and the point of the Moulens lyg South south east, and North northwest, and are distant 7. leagues.

The point of the Moulens and the Isle of Lambay, lyg South southwest, and North northeast, and are distant 21. leagues.

Lambay and Cattlingford, lyg North northwest, and South southeast, and are distant 18. leagues.

Lambay and the Isle of Dalke, lyg South southwest, and North northeast, and are distant 5. leagues.

The banke of Wiclo, beginneth chwart of the Forth of Dublin, and containe to the Isle of Tosker, they lyg North by West, and South by East, and they lyg in length 24. leagues.

Tosker and the point of the Grenord, lyg East and by North, and West and by South, distant 2. leagues.

And when you are bound to the Eastward off the Grenord, you must keepe the Mountaine of Washford aboue the low land, and so you shall goe cleare off all the dangers betwixt you and the shooe : And if you close the Mount with the low land, then you shall goe with the dangers.

Tosker and the Cape of Cinwall, lyg South by East, and North by West 40. leagues.

Tosker and the Salts, lyg East northeast, and West south west, distant 6. leagues.

The Salts and Silly, lyg South and North, and are distant three

The Sea-mans Kalender.

thre and thirty leagues:

The Salts and the Tower of Waterford, lyeth East and West, distant 5. leagues.

The Tower of Waterford and the Isle of Ballecutin, lyeth South-west and by West, and Northeast by East, but betweene the Tower of Waterford and Ballecutin, is a Haven called Yoghall, and a Sea-boord it is an Island called Capell Isle, and betweens Capell Island and Ballecutin, is 4. leagues.

The Tower of Waterford and Heluick-head, lyeth East and West, distant 3. leagues.

Capell Island and the Island of Ballecutin, lyeth West Southwest, and East Northeast, and are distant 3. leagues and a halfe.

Ballecutin and Corke Haven, lyeth West by South, and East by North, and are distant 3. leagues and a halfe.

Oyster Haven and the Old-head of Kinsale, lyeth Southwest and Northeast, distant 3. leagues and a halfe.

The Haven of Kinsale lyeth from the Old-head, North north-east, and going in, you must keepe Bane Castle open off the West land.

The Old-head and Cape Cleare, lyeth West by South, and East by North, and are distant 14. leagues.

Cape Cleare and Silly, lyeth East Southeast, and West northwest, distant 5 o. leagues.

There lyeth from Fasten a Haven called Crocke Haven, and is from it Northwest, distant 4. leagues.

There is a Haven called Scoll Haven, which lyeth from Fasten North and by West, distant 5. leagues.

There is a headland, halfe way betwixt the Old-head of Kinsale and Baltimore, which is called Kendonetedo, and it lyeth Northwest by West, from it is a good Haven called Clendor, there is a high Land to the Eastward, you must goe adoorth that high land, and so into the Haven. There is a ranie of Rockes on the West land, that goeth to the Eastwards, therefore keepe the East side, and when you come in, Anker before the Castle: there lyeth West northwest from the said head, a good Haven called Castle-haven, 4. leagues from it, and if you come out into the Sea

The Sea-mans Kalender.

and meete with the Stagges, you must goe Northeast into Castle-hauen, and in the entry ther is an Iland which you must leave on the East side of you, and another flat Iland which you must leave on the West side of you: you may goe dry at low water from it to the maine, soz it is very nigh to the West land, but be bold on the Easter Iland, and goe right with a Chappell that lyeth on the East side of the maine Land, and when you are thwart of the Chappell, you shall see a Castle of the West side, and thwart of the Castle you may enter in 12.fatham, it is from the Staggs three and a halfe leagues.

You must understand, that the flood shoothes from Dourze to the Old-head of Kinsale Porth northeast, and the ebbe to the contrary, and from the Old-head to the Tower of Waterford, Porth east and Southwest, and from the Dourze to the northwards Porth northeast and South southwest.

If you will goe in betwixt the Cash and the North-head of the grounds into Dalky, you must bring a round hill that stands like a Sugar-loafe Porth northwest, and then you shall haue 10. fathom: It floweth Southeast alouest the Channell and the barre of Poulbacke, there is eight scote water vpon it at low water, and threé fathom at full Sea: your Barre lyeth South and Porth, and you shall haue in the roade of Poulbacke, 14. scote at low water.

To sayle from Dalky to the Roade of Poulbacks, you must keepe a small Rocke open, a handspicke length, and when you come to the Barre, you must lye West southwest vp into the roade within the Beacon: then must you Anchore in fourteene fathom at high water, soz there be two Hilles on the Southside, a high Hill, and a low round Hill: bring them both in one, and then you bee in the best of the Roade. A South southeast Moone, makes a full Sea.

A Note

The Sea-mans Kalender.



A Note for going into
Milford.

If you come for Milford, you must leue all the Islands to the westwards, and when you haue the Grasham North Northwest, then the Hauen beareth Northeast by North, and when you come into Dall Rode, you may ride in three fathom and a halfe at low water, it floweth East by North.

Milford goeth in close vnder Cowein and Scabon, to the Eastward, and when you come open of Milford, you shall see an Iland like the Mawstone, which lyeth on the East side, and in Dall Rode you may ride for all winds, the Small lyeth from the Grasham three leagues, and betwixt them lyeth a ledge of Rockes, which is dry at low water: it lyeth midway, it is very dangerous comming betweene them.

A Gene-

The Sea-mans Kalender.
A Generall and Compendious Tide-table,
shewing what Moone makes full Sea or
high Water, in all these places
following.

Full Sea on the Coasts of Zutphen, Friezland
Holland, Zealand, and
Norway.

A ll the Iutlandish Iles be-		land, Wyering, and Amster-
foze the Riuers of Heuer, Eider and Else,	S. and N.	dam, S. W.
A t Ancuisen,	S. and N.	Without the bankes of Flan-
T he Isle of Vrke before Delfc Ile, at Emden, and all the shores of Flanders	S. and N.	danders, S. W.
B efore the Maers deepe.	E. and W.	Dodrechte and Ziericke Sea , S. W.
A t Hambrow and Antwerp,	E. and W.	Roterdam, and from Harlem to the Riuer of Maes, S. W.
U nderneath Holyland, W. S. W.		A t Ward-house, E. and W.
A t Egmount and Harlem,	S. E.	A t Briac, E. S. E.
I n the Breland and Vourd,	W. S. W.	C ape Gallant, S. by E.
B efoze the Easterne and Oile, Sterne entrances of the Emes or Riuer of Emden, before all the Coast of Friezland, and the Flye.	E. S. E.	T hs Hauens of Yotland and Norway, S. and N.
B efoze the Ghest of Texell,	W. S. W.	A t Corpus Christi point, S. S. W.
A pon the flats of west Friez-		B efoze the Een in the channell at Horn, Edam, Isle of Gore, before the Maes, before Can- fer and Teruer, S. S. W.
		B efoze the Willing and all the Coast of Zealand, S. S. W.
		N orth Cape and Blangbrow, S. W.
		F oxe-nose, and Saint Nicolas Roade, W. S. W.
		F ull

The Sea-mans Kalender.

Full Sea on the Coast of France,
Spaine and Portugall.

A Blacknesse, Arnuuy,
Rammekins, and Camfer,
S.S.W.

Within the Fosse of Caen,
S.S.E.

At Boleine, Calice, Grauelin, and
Dunkerke, halfe tyde, S.E.N.

The Iland of Basse, S.E.
Within the Seyne, before the
Caskets, before Garnesey,
S.E.

Befoze Cherborough and the
Rase of Blanquet, S.and N.

At Newport halfe tyde, S.and N.

At Seyne head, s.s.W.
At Garnesey, and before Saint
Poul,

W.b.S.
Bellisle and Holly Ile, w.b.s.

Without Vshant, and before
Bardeaux, E. and W.

Brittaine, Penmarke, Poytou,
and Gascoine, S.W.

Rase of Fountnes, S.W.b.W.
Bloy, and S.Mathews, W.s.W.

Abrouarth, and St. Malowes,
W.b.S.

Befoze the Killiats, S.W.
Portuise, and before the Rive
of Burdeaux, s.w.

From the Rase to the Pole-
head, S.W.

Befoze the Rive of Natintz and
before the Bay, s. W.

In the Bay within Vshant,
W.S.W.

At the Sept Iles, and at Calice
in the Creeke, w.S.w.

Within the Rive of Roan, and
from the Polehead of Burde-
aux, to the Forland of Foun-
taines; befoze Brouage, in the
river within all the Hauens
aforsaid, it floweth, s.w.b.w.

At S.Iohn de Luze, S.s.E.

At Concalo, and Saint Malo,
E.and w.

At Caps Saint Maries, S.E.b.E,
On all the coast of Biskay, Ga-
lizia, Portugall, and Spaine,
it floweth Southwest and
northeast.

Scotland.

A S.Magnes sound, s.E.b.E.

A Faire Iles, S.E.

In the Frith, S.S.E.

Faire Isle Rodes, S.b.E.

At Orkney, S.E.

England.

A Barwick it flowes s.s.w

A At the Staples halfe tyde,
N.E.b.E.

At Huncliffe foote, halfe tyde,
N.E.b.E.

The Sea-mans Kalender.

At Flambrow-head tyde,	quarter E.N.E.	Betweene Bridlington & Lawrenas, w.s.w.
At the Shoo,	S.and N.	Betweene Lawrenas and Cromer along the Well, halfe tide, E.and w.
At Timmouth quarter tyde,	S.W.	Betweene Cromer & Yarmouth roade, s.E.
At the Sporne, Newcastle and Humber.	W.b.S.	Betweene Laistow roade and Orfordnesse, s.E.b.s.
Winterton,	E.S.E.	Betweene Orford and Orwell waues, s.s.E
Blacke-tayle and the Nowre,	S.b. W.	Betweene the Naze and the Warre-head of Colne, s.b.E.
Blackney and the Shields.	E.t w	At the West end of the Nore, s.b.w.
Yarmouth,	s.E.b.E.	Rochester and Maldon, s.b.w.
Orford and Albrew,	s.E.b.s.	At Grauesend, s.s.w.
Whitbay and Robin-hoods bay.	s.w.	London and the middest of the Heads or straights, s.w.
Before Hartlepole,	s.w.	At the north Forlands, s.s.E
Scarbow quarter Tyde,	w. s.w.	At Beachy, s.and N.
Hull and Lin halfe tide,	E.t w.	Seuen Clifffes, s.E.
Before Humber's mouth,	N.w.	In the Downes, s.s.E.
At Burnham quarter tide,	E. and w.	In the Chamber and at Gore end, s. b.E.
Cromer,	S.E.	At Cambernes and at the Needles, s.E.b.s
At Liestow quarter tide,	s.s.E.	In Cambernes roade, s.s.E.
Harwich and Douer,	s.s.E.	Portsmouth, Hampton and the Isle of Wight, s.and N.
Harwich within,	s.b. E.	In the Oiting from the South Forland to the South Forland, it runneth halfe tide; and from the South Forland to the Nasse, it runneth halfe tide, and halfe quarter tide, and
South Forland,	s. s.E.	
Before Margate and Thames mouth,	s.b.E.	
Leigh and Kentishknock,	s.t N.	
Spits and along the Swine,	s. and N.	
Between Timmouth and Flambrow-head.	s.w.	
Betweene Flamborow-head and Bridlington-bay.	S.w.b.w.	

The Sea-mans Kalender.

and from the Nasse to Fairly
halfe tyde , and from Fairely
to Beachy quarter tyde vnder
other.

At Portland rode, E.S.E.

At S. Ellens, S.E.b.E.

Within the Race of Portland, at
Poole in the Hauen, at Home-
head, and thwartz of Plimouth
and Dartmouth. S.E.

At Waymough, E. and W.

At Famouth, Foy, Fourne, Pli-
mouth and Dartmouth. W.b.s
Bristow and Foulnes. E.b.S.

At the Start, E.b. S.

Moshole, W.s.w.

S. Dauids head, E. and W.

Milford-häuen, E.s.E.

Isle of Man and Catnes, s.E.

Three leagues off the shore, at
the Lizard to the shore, and to
the Lands-end, E. s.E.

Within Torbay and in the Bay
of Carnaruen, W.b. s.

At the mouth of Seuerne, W.b.s

At the Moonles, W.b.s.

From the Lizard to the Sorlings
W.b.s.

Before Silly in the Channell, E.
and west.

At Silly halfe tyde, S.S.W.

Within Mounts Bay, and in the

Sea of Wales and Seuerne,
W.s.w.

At Lundy and the Holmes of
Bristow, E. and w.

In the Sleeue betwene Silly and
Vshant, S. and North.

Note that the floud sets in at
the East end of Wight till a
Southeast Moone : in the
roade of Dungenesse South
Southeast, but without in the
Channell a southwest Moone
full sea : from the Seames,
and in the broad sound be-
tweene it and Vshant, the
floud runneth East North-
east, and West southwest.

Ireland.

At Caldy, W.b.s.
Waterford and Abermo-
ricke, E. and w.

At Cape-cleere, E.s.E.

Macknels Castle, S.E.b.E.

Dublin and Lambay, S.E.b.E.

Dunbar and Kildier, S.E.

Dungarum, Kinsale, Cerke, Ha-
uen and Baltemore. W.s.w.

The

The Sea-mans Kalender.

*The Course of all the Coasts of Holland,
Zealand, France, and Spaine, vpon what
point, and in what distance they are.*

From the Isle of Texell vnto Egmont.	S. & b. W.l.5.
From Egmont vnto the Maze,	S.S. W.l.11.
From the Maze vnto the Wieling.	S.W.l.12.
From the Wieling vnto the head or straight betwæne Douer and Calice.	W.S.W.l. 18.
From the Isle of Walkeren or Flushing vnto Calice, S. w. & by w.l.22.	
From Blackenesse vnto Deepe,	S.S.W.l.12.
From Deepe vnto Seyne-head, or the riuier of Seyne, w.s.w.l.11	
From Seyne-head to the Riuier of Cane,	S.w.l.8.
From thence vnto Cape de la Haguc,	N.w.l.12.
From thence vnto the Caskets,	W.& by N.l.8.
From the Caskets to Gernesey,	S.W.& by w.l.4.
From Gernesey to St. Malo,	S.S.E.l.10.
From Gernesey to the Sept Iles,	S.W.&b.s.l.12
From the seauen Iles to St. Poul,	w.s.w.l.8.
From thence to the Fourne,	w.s. w.l.10.
From the Caskets to the Fourne,	S.w. & b.w.l.34.
From the Fourne to St. Mathewes point,	S.s.E.l.3.
From thence to Fontenau or Fonteines,	S.& by E.l.5.
From Vshant to the Seames, Seabord it,	S.l.7.
From Fontenau to the west Penmarkes,	S.E.l.7.
From thence vnto the Isle of Croy,	E.&b.S.l.12.
From the west Penmarkes, to Bell Ile,	E.s.E.l.15.
From thence to Heys somewhat more Easterly,	S.E.l.12.
From thence againe vntill within Piquilier,	E.&b.s.l.10.
From thence againe vnto Croyfill,	E.& by s.l.9.
From Piquilier vnto Heys,	E. & b.w.l.5.—
From Heys to the Killiats,	E.s.E.l.10.
From the Isle of Heys to Porthuis,	S.E.& b.E.l.12.
	From

The Sea-mans Kalender.

From S. Martins Iland to the burning Isle,	S.E. & b. E.l. 3.
From the Burning Isle to the Oyster banks,	S.S.E.l. 3.
From S. Martins Isle to the Tower of Cordam,	S. & E.l. 12.
From thence to Bayone,	S. & N.l. 28.
From Baynone to Orio,	W.S.W.l. 5.
From Orio unto S. John de Luz,	E.S.E.l. 6.
From Orio unto S. Andrew,	W. & b. S.l. 20.
From S. Andrew to Cape de Pennas,	E. & W.l. 30.
From Cape de Pennas to Ribadeo,	S.W. & b. W.l. 12.
From Cape de pennas to Ortegall,	W. & b. W.l. 20.
From Ortegall unto Ribadeo,	E.l. 14.
From Ortegall unto the Isle of Cizaega,	S. & b. W.l. 13.
From Cizaega unto Coronna,	E.S.E.l. 6.
From thence unto Cape Coriana,	W.S.W.l. 10.
From Coriana to Cape Finisterre,	S. & N.l. 3.
From Finisterre unto Bayone,	S.E. & b. S.l. 14.
From Bayone unto Port de Port,	S. S.E.l. 18.
From Port de Port to Aueiro,	S. & N.l. 8.
From Aueiro to Montega,	S.S.W.l. 5.
From Montega unto Barlings,	S.W.l. 12.
From Barlings unto Roxende,	S.& b. E.l. 12.
From Roxende to S. Viues point,	S.E. & b. S.l. 8.
From thence unto Cape of S. Vincent.	S. & N.l. 24.
From thence unto Pharo,	E. & W.l. 14.
From Pharo unto Lepe,	N.E. & b. E.l. 12.
From Pharo unto Saltees,	E.N.E.l. 18.
From Saltees to Chipiona,	S.E.l. 8.
From Chipiona to Calis Malis,	S.E.l. 6.
From Calis unto the straight of Gibraltar,	S.E.l. 8.
From Calis unto Cape de Cantin,	S.W. & b. S.l. 6.
From Cape de Cantin to the Isle of Madera,	W.l. 14.
From Cape S. Vincent to Madera,	S.W. & b. W.l. 14.
From Roxende to Madera,	S.W.l. 130.
From Roxende to the Isle of Tercera,	W.L. 20.

C OCTOBRA 1651. THE

The Sea-mans Kalender.
 The Courses of England, Irelan^d,
 and Scotland.

From Boecknes unto Leeth in Scotland,	S.S.W.I.38.
From Leeth unto Barwicke,	S.S.E.N.8.
From Barwicke unto the Holy Isle,	E.S.E.I.4.
From Abbes-head to the Easterne end of Farne Iles,	S.E.I.6.
From the Iles of Farne to the Tees mouth,	S.S.E.I.14.
From the River of Tees to Flambrow-head,	S.E.&b.S.I.14.
From Flambrow-head to Blackney,	S.E.I.18.
From Blackney unto Winterton,	S.E.I.8.
From Winterton unto Lestoff,	S.&b.E.I.8.
From Lestoff unto Orford Haven,	S.I.7.
From Orford unto the Foreland,	S.S.E.I.13.
From the Foreland to Douer,	S.I.7.
From Douer to the Shingles, or the Nesse point,	S.w.&b.W.I.7.
From the Nesse point unto the Beache,	W.S.W.I.10.
From the Beache to the Isle of Wight,	W.&b.S.I.15.
From Wight unto Portland,	W.&b.S.I.10.
From Portland unto the Start point,	W.S.W.I.14.
From the Start unto Rainhead point,	W.N.W.I.6.
From Rainhead unto the Dodmans point,	W.S.W.I.8.
From Dodmans to the Lizard point,	S.W.&b.W.I.6.
From the Lizard to the Iles of Silly,	W.I.12.
From the Lizard to the Lands-end,	W.N.W.I.8.
From the Lands-end to the Isle of Lundy,	N.E.I.14.
From thence unto the Holmes of Bristow,	N.E.&b.E.I.16.
From thence unto the Isle of Caldie,	W.S.W.I.25.
From thence to the Iles of Salteys, on the Coasts of Ireland,	W.N.W.I.20.
From Salteys to Cape Cleere,	W.S.W.I.25.
From Cape-Cleere to the Isle of Dorsey,	W.I.12.
From the point of Dorsey to the Isle of Blakem,	N.N.W.I.16.
From Blakem unto the Iles of Arrant,	N.N.E.I.14.
From the Iles of Arrant to Galwickc, or the Galfe in Ireland,	E.N.E.I.6.

Of

The Sea-mans Kalender.
Of diuers and sundry Courses
ouer the Westerne Sea.

From Texell on the Coast of Holland to Flamborow,	W.N. W.I. 45.
From Texell unto Winterton in Norfolke,	W.I. 32.
From the Isle of Texell unto Lestoffe,	W. & b.S.I. 38.
From the River of the Maze in South Holland, unto Harwich.	W.I. 26.
From the said Maze to the Foreland of England, W. & b.S.I. 25.	
From the Marsdeepe in North Holland, to the said Foreland,	S.W.I. 36.
From the said Marsdeepe to Calice,	W. & b.S.I. 38.
From Douer unto Boloigne,	S.E.I. 8.
From Boloigne unto the Beache,	W.I. 16.
From the Beache to Diepe in Normandy,	S.E.I. 18.
From Diepe unto the Isle of Wight,	E.S. E.I. 28.
From Wight to the Scyne-head or mouth,	S.E.I. 20.
From the sayd River of Seyne to Portland,	W.N.W.I. 30.
From the Isle of Wight unto the Caskets,	S.W. & b.S.I. 14.
From Gernesey unto S. Malo in Normandy,	S.S.E.I. 8.
From the Caskets to Portland,	N.b.W.I. 10.
From the Caskets to the Start point,	W.N.W.I. 16.
From the Start to the Sept-Iles in Normandy.	S.S.E.I. 24.
From the Start to S. Poul in Normandy,	S. & b.W.I. 22.
From S. Poul to Portland,	N.E. & b.N.I. 22.
From the Fournes to Ram-head,	N.N.E.I. 28.
From the Start point unto Vshant,	S.W. & b.S.I. 32.
From the Fournes to the Lizard,	S. & N.I. 32.
From Vshant to the Iles of Silly,	N.N.W.I. 26.
From the Sorlings to Milford Haven,	N. & b.E.I. 25.
From the Sorlings to Wexford in Ireland,	N.N.W.I. 34.
From the Sorlings to Cape-Cleere,	N.W.I. 24.
From Cape-Cleere to Cape de Finisterre,	S.E.N.W.I. 30.
From the Lizard to Cape de Finisterre in Galicia,	S.S.W.I. 12.

The Sea-mans Kalender.

From Vshant unto the Ile of Cizaga in Galizia,	S.S.W.I.58.
From Vshant to Laredo in Biscay,	S.S.E.I.58.
From the Seame Rockes to S. Sebastian in Biscay, Southeast and	by S.I. 10.
From Vshant againe to Cape de Pannas in Biscay,	S.& N.I.70.
From Belile unto Ortegall in Galizia,	S.W.I.75.
From S. Martins Ile to Ortegall,	W.S.W.I.85.
From Ortegall to Cape de Coriana,	S.W.&b.W.I.34.
From Cape de Finisterre to the Iles S. Michael,	W.S.W.I.185.
From S. Michael to the Isle of Tercera,	N.W.I.36.
From Cape de Finisterre to the Isle of Madera, Southwest, & by	W.I.190.
From Madera unto the great Isle of Canary,	S.E.b.E.I.60.
From Cape de Finisterre to Bayone in Galizia,	S.&b.E.I.15.
From Cape de Finisterre to the Isle of Barlings,	S.& N.I.50.
From the Barlings in Portugall to the Isle Canary,	S.S.W.I.170.
From the Isle of Madera to Calis malis,	E.N.E.I.150.
From Calis to Cape de Cantin,	S.w.&b.S.I.65.
From Cape de S. Vincent unto Cape Cantin,	S.& N.I.62.
From Cape de S. Vincent unto the Isle of Madera, Southwest,	&b.W.I.120.
From Roxen in Portugall to the Isle of Tercera.	E..&W.I.210.

The Courses of Norway, Swetland, and East Finland.

From Schuytenes to the Westeen,	S.&b.E.I.4.
From Westeen or Wostone to the Iedder,	S.S.E.I.4.
From the Iedder to the Worsteen or Forstone,	S.E.I.5.
From the Forstone to the Noes,	E.S.E.I.6.
From the Noes unto Reperwicke,	E.N.E.I.8.
From Reperwicke to Mardon,	N.E.I.10.
From Mardon unto Iofferland,	N.E.I.8.
From Iofferland unto Langhesondt,	N.N.E.I.24.
From Langhesondt to Forderoer,	N.E.&b.E.I.6.
From	

The Sea-mans Kalender.

From Ferderoer vnto Soen-water,	N.I.6.
From Ferderoer vnto Roeghe,	N.N.E.I.4.
From Ferderoer vnto Akersond,	E. N.E.I.6.
From Akersond to Maesterland,	S.E. & b.E.I.4.
From Pater noster to Nyd inke,	S.E.I.8.
From Nydrink to VVaerberghe,	S.E.& b.E.I.4.
From Waerberghe to Swedoruer,	S. S.E.I.6.
From Swedoruer vnto Col,	S.S.W.I.3.
From Col vnto Lapland,	S.E.I.3.
From Lapsand vnto Ween,	S.S.E.I.2.
From Ween to Drakeriffe,	S.& b.E.I.7.
From Drakeriffe to Steden,	S. & b.W.I.4.
From Steden to the North end of Bornholme,	E.& b.N.I.15.
From Bornholme vnto Anno.	N. & b.W.I.8.
From Anno vnto the Rockes,	N.E.I.8.
From the Rockes vntill within the Calmersond,	N. N.E.I.10.
From Calmersond to the Sweedish Ionckfrow,	N. N. E.I.8.
From Ionckfrow to Landfoort,	N.N.E.I.8.
From thence vntill before Dury-hauen,	N.E.& b.E.I.8.
From the Stockhomes Shares to View of Abo,	N. E.& b.N.I.24.
From View vnto Luns Vtschares,	E.N.E.I.28.
From the Vtschares to the Ile Putfuagto,	E.& b.N.I.30.
From thence vnto Somere,	E.& W.I.9.
From Somere to the Rod-hole of Wiburgh.	N.E.I.9.
From the Rep-hole to Traelsand,	N. E. & b. N.I.2.
From thence vnto Wiburgh,	leagues 2.

The Depth and Soundings, neere diuers

Prouinces. And first, of Gascoigne ;
Poictou, and Britaine.

VV Ithou the River of Burdeaux, there is 14. Fatham depth, but when you come within the sight of Cordam Tower, 30. Fatham.

Ouer against the Coast of Poictou, 16. leagues without Oleron, you haue 36. fathom, but comming neere the land 8. leagues from the shore, you haue 35. fathom : In the Channell betwænes Porthuis and Heys, it is 30. fathom, and as much in the channell of Heys : as also betwene Heys and Belile without the channell is 35. fathom, but within 25. without Heys, two kennings off, there is a sound 45. fathom.

Twenty two leagues Southward off Belile, is 70. Fatham, but 9. leagues from the Northwest point of that Iland, towards the Southwest is 60. fathom : and ouer against the midst of Belile, in 40. fathom depth, you shall see Land. In your course betwene Belile and the Seames, you may come no nearer then 50. or 45. fathom, if you sayle from Belile West and by North: when you are against Gloyland, you shall finde 60. fathom depth, without and within the Rocke, which stands off Gloyland to the Seawards, you haue 40. fathom water : in 60. fathom depth without the west Penmarkes, you may sayle Northwest by West without the Seames, but by night come no nearer then in 55. fathom, for the ground is grosse and red sand full of red flints : halfe a league west southwest off the Seames, is a ledge of Rocks, where you haue 7. fathom depth, but betwene the Seames, and the Rocke is 50. fathom.

In the Channell betwene the Seames and Vshant, is 55. fathom depth, the ground is grosse and red sand, with little round stones red and blacke : neere to Vshant is 45. fathom, but within it is of a variable depth: Southwest almost 6. leagues off Vshant,

The Sea-mans Kalender.

you haue 70. fatham, and the ground is fine white sand, with lit-
tle white shelles, and other small things like needles, and then is
Vshant Cast from you : but if the sand be grosse and white, min-
gled with great and white shelles, then it is South east to you: but
if you doubt of these grounds, goe Northerly, if your sound be dee-
per, then are you towards the Seames, but if not so deepe, then are
you in the Channell almost North off Vshant.

Betwene Vshant and Obueracke, in the trade, it is 60. fatham
depth : betwene Vshant and the Sorlings in the middest of the
Channell there is 70. fatham : betwene the Seames and Vshant
in 70. fatham water, the ground is of little blacke stones easie to
be broken and of yellow earth and clay : but if you finde red and
hard sand, goe Northward till you happen on white sand, min-
gled with long stroakes, and then you are in the Channell.

If from Cizarga you sayle North northeast, in the Spanish
Seas toward Vshant, and finde your selfe in 80. fatham, you are
14. or 15. leagues off Vshant, but comming neare you shall haue
70. fatham water, and be 10. leagues from Vshant: but if you finde
the ground to be yellow shelles, and little blacke stones, then are
you towards the Seames, therefore you must with the tyde beare
off Northward to shun Vshant, vntill you finde white sand, and
things like needles, for such are the grounds of the Channell.

Betwene Vshant and the Isle of Base, when you sayle at foure
fathom water, you are 4. leagues off the shore, but by night come
no nearer then 25. fatham : when you are two leagues off Ob-
veracke, you shall finde 25. fatham depth, 8. leagues off the Sept
Ilands, you haue 55. fatham.

A league without the Rockes of Obueracke, there is a blinde
or hidden Rocke, so that if you are to sayle vpon abord betwene
the Fournes and Obueracke, come no nearer the blind Rocke then
40. fatham, but Eastward you may sayle in 30. or 25. fatham.

If a Ship sayling west, S. W. and Southwest by W. off Silly
at 80. fatham water to be found to be vnder 40. degrees 25. min.
of Altitude, she is 26. leagues from Land, and must goe East and
by North till shes get 66. Fatham water, for then shes is in the
Channell betwene Silly and Vshant, and then if shs be bound for

The Sea-mans Kalender.

England, she must sayle more Northward, and betwæn the Lands end and the Lizard she shall haue 55. fathom depth.

The soundings and grounds betweene Ireland, England, and Normandy.

TWEE Leagues without the Iles of Dorsey neere Ireland, it is 45. fathom deepe : in the Channell betwæne Dorsey and Cape-cleare is 42. or 43. fathom, the Channell from Cape-cleare to Saltees hath 45. fathom, but 2. Leagues off Ireland it hath but forty : betwæne Saltees and Milford it is 44. fathom deepe, and betwæne Lundy and Silly 38. fathom : In the mid-way betwæne Silly and Milford is 44. but North of Silly 40. and 42. and neere England by the Lands end, the Channell is of 50. fathom deepe.

Comming from Cape Finister, sayling N. N. E. if you haue 80. fathom, you are 20. Leagues off the shore, and the ground is small blacke stones with great red Sand : In the same course, when you haue but 60. fathom, you are within 12. or 14. leagues of the shore, but shall not so soone kenne land as you thinke for : you shall a great while haue 60. fathom : being at the N. parts of the Channell about Silly. betwæne Vshant and Silly, the Channell is 70. fathom : on the S. side of Silly, the ground is small red stones, and fine white Sand : Duer against the Lizard and Falmouth 4. Leagues from shore, is 52. fathom : betwixt Foy and Plimouth sound, in the Channell nighest, is 60. fathom, betwæne the Lizard and the Start, beare no nærer the shore then 35. fathom, you may cast anker in the trade of Channell in 25. fathom, and so you shall lye within the Foreland streame : betwæne Plimouth and the Sept-Iles in the middell of the Channell is 55. fathom, but 4. leagues S. S. W. off Plimouth is but 35. fathom : S. S. E. of the midland of the Start, is 45. fathom, but from thence 5. or 6. leagues S. E. is 54. fathom : in the Channell betwæne the Caskets and Portland is 40. fathom, and a league N. of the Isle of Aldernay is a hole or pit 80. fathom deepe: all the rest of the channell betwæne Portland and Aldernay, is of equall depth, viz. 40. fathom:

The Sea-mans Kalender.

fathom : when you are within kenning of Portland , your sound-
ing is 34. fathom : and 2. leagues off Wight, 36. fathom : also
2. leagues Eastward of Beachy , betwæne Picardy and Wight,
the Channell in the middest is 38. fathom : between Winchelsey
and Picardy 24. fathom , the shoalds betweene the heads called
the Vrowensand, hath but 3. fathom and a halfe, but on the South
side of it, is 24. fathom : and in all the faire way betwæne Zea-
land and Douer, it is 24. fathom dæpe.

Depths of the North Sea from the Foreland.

In the Channell from England, Foreland, and Lands of Flaun-
ders, you haue 24. fathom dæpe : but 3. leagues N.W. by W.
of the Countrey of Zietrickz : called Botbrecke, it hath but soure
fathom depth without the shoald : the channell of Zeland is 26.
fathom : N.W. off Harlem, 8. or 9. miles within the Sea, there be-
ginneth a shelle called Debredde Verthien, reaching alongst the
Coast of Holland to the plains of Ameland, where it endeth : ouer
against Harlem and Egmont , is 13. 14. or 15. fathom , and the
ground is full of Dale, mingled with blacke sand like mustard-
seed : the said shelle hath 15. 16. or 17. fathom depth : betwæne
Texell and Vlyeland, where the ground is grosse red sand, 6. or 7.
leagues from the Shore, soz there the shoald is narrower then it
is towards the South end of the Channell : without the shoald
betwæne Zeland and Texell is 26. fathom dæpe, as farre as the
shoald whiche the Fishers call Dog-sand. In the Channell on
Englands side, ouer against Yarmouth, is 35. fathom, but against
Flamborough and Scarborough point 38. fathom, whereas the
white shelle called Dog-sand beginneth, reaching into the North
Seas to the channell of Helichland: this shoald (where it is with-
in kenning of Flamborough point) hath but 9. or 10. fathom, but
when in the same land you find 12. fathom, then Texell is from
you Southeast, almost 30. leagues, but when you are come to 16.
fathom, then are you within 21. leagues S.S.E. of Vlyeland.

A Ship that comes from the Riffe, finding 18. Fathom depth

The Sea-mans Kalender.

on the aforesaid land, is then 20. leagues South and by East off Vlyeland, but at 22. fathom, you must then sayle towards the Vlye, South and by West, and South Southwest, but if in the Channell of Helichland, 24. or 26. fathom bee sound, then must you sayle Southwest, and Southwest by South, and then you come to the Schelling h: But if in Helichland sound you haue 27. fathom, then are you altogether to the Eastward off it: betwene the Riffe and the Doggersland, the Channell is 26. fathom without the Channell Westward, it is 32. fathom deepe.

A Ship that comes out of the English Straights, or out of Zealand, hauing at the Riffe 24. fathom, is from the Naes in Norway, 18. leagues North and by East, but hauing 20. fathom, is but 16. leagues from it North: and finding but 18. fathom, is then 18. leagues off it North by West: The course from thence to the Holmes, is 12. leagues North by East: From thence to the point of Scackghens, 18. leagues Northeast by East, there is a Rocke of one fathom depth, Northeast, and Northeast by East off the Holmes, two leagues from shore.

Depths neere Iutland and Ameland.

In the Sea without Iutland, a myle from Dodenberg, is a Banke called Reece-horne, stretching out 8. leagues West by South in some places but 3. fathom deepe, and in some places may be sayled ouer, and become a Roade for a Northwest and a North wind in 20. fathom: From Ameland towards the Sea, the ground is grosse sand, red and blacke, mingled with shelles: thence Southwards in 16. fath. sayling 3. hours, you shall come to the smooth Sea of Ameland, where the ground is fine sand, with shelles: North from Schelling, in 24. fathom, is fine white sand, and in 8. fathom, white and blacke sand mingled. Vlyeland hath white sand with shelles, and thin blacke sand in 16. fathom depth: From the West end of Vlyeland, is great and red sand mingled with blacke like unto Mustard seed: about six or seauen leagues from shore at the East end off Schelling to Sealwards, at 18. fathom, is fine white sand mingled with blacks, haing

The Sea-mans Kalender.

In it things like needles. Duer against Borke in the Westerne Emes 17. or 18. fathom depth, land may be seene: the ground is grosse grauelly sand: at 14. Fathom may Aineland bee kend, but Schellingh at 16. and Vlyeland at 15. or 16. Fathom water. At the North Hooke of Texell, Land may be seene at 16. fathom. Holland at 14. or 15. When you sayle within the shoald called the Breduirthien, which beginneth Northwest of Harlem, and stretcheth alongst the Coast of Holland, to the West end of Vlyeland, it is 7. or 8. leagues from the shore.

Soundings and Grounds neere the Schaw.

A Great league West by North from the Schaw, is 35. Fathom depth: North northeast a great league off the corner of this Point is 38. Fatham, and when the Point is Northeast from you, then you haue 17. Fathom. Betweene this point and Leson, the Channell is 20. Fathom deepe, and the ground like clay or dirt: betwixt Anhout and Waersbergh, in the middest of the Channell is 22. Fathom water: betweene Leson and Anhout, the ground is fine and stony: neere Waersbergh, is a shoald of 17. Fathom depth: betweenne Anhout and Coll, is another shoald of 17. Fathom, where some tyme it is troublesome like a Whirle-pool.

Depths of the Easterne Seas.

Betweene Oeland and Gothland, the soundings are bnequall, sometimes of 20. sometimes of 23. Fathom, the ground grosse and blacke stony sand, like Pease: when the South end of Oeland is 2. leagues from you Westwards, you haue 27. fathom, where also you may gage water: but when the Chappell of Sudernoorden beareth West Northwest off you, then haue you 31. Fathom, and ground fit to gage water: Duer against the Rocke in the faire way is 52. fathom, and a clay ground, but fit for gaging: betweenne the greater and lesser Carta is 14. fathom, vnder which is safe roade for Ships, there is a shoald betweene Houberg and

Ostergard,

The Sea-mans Kalender.

Ostergard, 4. fathom depth, the ground great red sand, but hardly from thence can you ken Gothland out of the top : there is also to the Eastward another shoald of 36. fathom, which when you are past, you haue more then 40. Fathom water : when the point of Righ is three leagues Southeast from you, then haue you 30. Fathom : but when it is from you halfe a league South Southeast, you haue but 15. fathom, the ground is white sand : but when it beareth West a small league from you, then you shall find 16. fathom ouer against Heel, halfe a league from the shore it is almost 3. fathom deepe : the rode for ships at Heel hath 25. fathom depth : betwene Moan and Falsterborne is 14. fathom depth: betwene Stead and Falsterborne, in the very Channell is but 22. Fathom deepe : neare Falsterborne : it is full of shoaldes, but neare Stead you haue 13. Fathom water : betwene Darkeriffe and Southolmen, which is moze sholdy, there is 5. fathom wanting two fute : From thence toward the Sound it is something deeper, 6. 7. 8. 9. or 10. fathom.

A Note of certaine and most dangerous places in the Sea.

The principall and most perilous of all, is the Mael-streame well of Slorp, called the Mouskstreame : which lyeth on the backeside of Norway in 68. degrees on the Northside of an Island of Rocke called Weeray. This well draweth the water vnto it selfe during the whole floud (which is the space of 6. houres and 12. minuts) with such an indraught and force, and with such a noyse through the tumbling and sailing of the waves & streames one vpon the other, that it is rather to wonder at then to write of. So that during that time, within the space of moze then two leagues round about that Rocke of Mouske) vnder which that water floweth) no Ship or other vessell may come neare, for they shoulde to their vtter destruction be drawne into it and swallowed vp : but all the time of the Ebbe the water is so strongly cast vp againe, that no kinde of substance or Mettall, how heauy soever it bee, can there sinke. So that our Northerne Fishers at that time

The Sea-mans Kalender.

time doe with their Tollen or Fishing Boates, take many and strange formed fishes, which they draw into their Boates with Hookes and lines, which they haue ready layd for that purpose: for that during the Ebbe, they cannot returke into the Gulph, nor get vnto the water.

The Northerne people that inhabite about those Kockes, doe thinke that streame passeth away vnderneath a part of Norway, vnder the North bottome in East Finland: because that in that place there is likewise such a Maelstreame, (though not altogether so strong nor dangerous) where the like Fishes are taken: and the water is in like sort troublesome, as it is vnderneath, and about the Kocke of Mouske.

Whereupon, many experimenterd Pilots doe call the said Slorp, the Pauell of the Sea, which causeth the courses of the Ebbes and Flouds about the Lands that are on this North side of the Equinoctiall, as the most convenient place for that purpose, to spread the waters South, and North, East and West: that is to say, Northerly towards the Pole Articke, South-easterly on the backe-side of Russia and Tartaria, towards the Streight of the great South Sea called Mar del Sur, wherein the Spirits Islands (called the Molluccas, neare the Equinoctiall) are lying Southward to the North Sea of these Low Countries: As also on the backeside of Scotland and Ireland, toward the Spanish and Atlanthicke Seas, and towards the Northwest beyond Iceland, towards Furbishe straights, where it is thought the way vnto Cattay may be found.

There are moreover to be feared vpon the Westerne Seas, very dangerous streames and Gulphes, as in the Race of Portland, where oftentimes happeneth such turning and tumbling of waues and streames, that the Ships which passe that way, are many times in great perill.

Moreover the Race of Blanquert, betwene Normandy, and the Iles of Alderney, roareth and rageþ so dangerously, that many Ships fall therein headlong, so depe, that sodainely they are swallowed vp and sunke to the very bottome.

The Race of Fountney, is more dangerous then all these, where

The Sea-mans Kalender.

In many smal Wessels and Barkes of Britany and of other
Countries, are suddenly devoured and cast away : and the en-
trace of the Garonne, called the River of Burdeaux, betwene
the TOWERS of Cordam, and the Sylpheme and Northerne
Ailes, is likewise very perilous, and many Ships doe often pe-
rish there if the Pilots be not skilfull and well acquainted with
the place. *Take a diligent course to shew the place of the
dangerous entrance of the Garonne, and the
place where many ships have beene lost.*
And these aforesaid, being the most full of danger, it behoueth
each Pilot or Master to haue especiall knowledge therof, and
great care to prevent the danger that may ensue vnto them there.
by. G. R. 1633. 3. 1. 1634. 3. 1. 1635. 3. 1. 1636. 3. 1. 1637. 3. 1. 1638. 3. 1. 1639. 3. 1. 1640. 3. 1. 1641. 3. 1. 1642. 3. 1. 1643. 3. 1. 1644. 3. 1. 1645. 3. 1. 1646. 3. 1. 1647. 3. 1. 1648. 3. 1. 1649. 3. 1. 1650. 3. 1. 1651. 3. 1. 1652. 3. 1.

The yeares for which the Tables of the Sunnes place and Declination (following) serue.

First.	Second.	Third.	Leapeyeare;
1630	1630	1631	1632
1633	1634	1635	1636
1637	1638	1639	1640
1641	1642	1643	1644
1645	1646	1647	1648
1649	1650	1651	1652

Here-

Hereafter followeth a most excellent, necessary and compendious Kalender, shewing the Prime, Epact, Dominicall Letter, Leap-years and moueable Feasts, for 24. yeres; inclusively comprehending therewith the true day and houre of the Moones Conjunction or Change, for 19. yecres to come, with the true place of the Sunne, and his Declination from the Equinoctiall, both Northwards and Southwards vpon every degree thereof, through the 12. Moneths of the yeare.

Year of our Lord	Prime.	Epact.	Sunday Letter.	First Sunday in Lent.	Easter day.	Ascensiō on day.	Whit- sunday.	Trinity Sunday.
1639	15	15	D	Febr. 22	Aprrill 5	May, 14	May, 24	May 31
1640	16	26	C		14 Marc. 28	6	16	23
1641	17	7	B		27 Apr. 10	19	29	June 5
1642	18	18	A G		19	1	10	20 May 27
1643	19	29	F	Mar. 10.	21	30 June	9 June 16	
1644	1	11	E	Febr. 23	6	15 May	25	
1645	2	22	D		15 Marc. 29	7	17	May 24
1646	3	3	CB	March. 6	April 16	25 June	4 June 11	
1647	4	14	A	Febr. 26	9	18 May	28	4
1648	5	25	G		11 March 5	3	13 May	20
1649	6	6	F	March. 3	April 14	23 June	2 June 9	
1650	7	17	ED	Febr. 22	5	14 May	24 May 31	
1651	8	28	C	March. 7	25 June,	3 June 13	June 20	
1652	9	9	B	Febr. 27	10 May,	19 May	29	5
1653	10	20	A		19	2	11	21 May 28
1654	11	1	GF	Marc. 10	21	30	9	16
1655	12	12	E	Febr. 23	Aprrill 6	15	25 June	1
1656	13	23	D		15 Mar. 29	7	17 May	24
1657	14	4	C	March 7	Apr. 18	27 June	6 June 13	iiiiix.
1658	15	5	BA	Febr. 20	2	11	21 May	28
1659	16	26	G		11 Marc. 25	Aprrill, 3 May	13	20
1660	17	7	F	March 3	Apr. 14	23 June	2 June 9	
1661	18	18	E	Febr. 16	Marc. 30	Aprrill, 8 May	18 May 35	
1662	19	29	DC	March 8	Apr. 19	28 June	7 June 14	

January hath 31. dayes.

The Prime	Fast.	Leng. of the day.	True Place and Declination.											
			in yr First yeare.						in yr second yeare.					
			H. M.	D. M.	D. M.	H. M.	D. M.	D. M.	H. M.	D. M.	D. M.	H. M.	D. M.	D. M.
viii. 7.	1 A	New	7 52	1 21 38	21 47		8 21	23 21	49					
	2 B	yeares d.	7 54	2 22 39	21 37		8 22	24 21	39					
3. xvi.	3 C		7 58	3 23 40	21 37		8 23	26 21	29					
	4 D		8 0	4 24 41	21 16		8 24	27 21	18					
v. 8.	5 E	Fast.	8 3	5 25 43	21 5		8 25	28 21	17					
	6 F	Twelfe	8 6	6 26 44	20 53		8 26	29 20	56					
i. xiii.	7 G	day.	8 9	7 27 45	20 41		8 27	30 20	44					
ij. 10.	8 A	Lucian.	8 12	8 28 46	20 28		8 28	32 20	32					
x. 17.	9 B		8 15	9 29 47	20 16		8 29	33 20	19					
vxiiij. 3.	10 C		8 18	10 ≈ 49	20 3		8 30	≈ 34 20	5					
vij. 4.	11 D		8 21	11 1	1 50	19 49	1 1	1 35	19 52					
	12 E		8 24	21 2	51	19 37	1 2	2 36	19 38					
	13 F	Hillary.	8 28	13 3	52	19 21	1 3	3 37	19 25					
2. xv.	14 G		8 32	14 4	53	19 7	1 4	4 38	19 10					
	15 A		8 36	15 5	54	18 52	1 5	5 39	18 55					
iiiij. 2.	16 B		8 40	16 6	55	18 37	1 6	6 40	18 40					
xiiij. 11.	17 C		8 43	17 7	56	18 21	1 7	7 42	18 25					
ix. 5.	18 D		8 46	18 8	57	18 5	1 8	8 42	18 9					
6. j.	19 E		8 49	19 9	58	17 49	1 9	9 43	17 53					
	20 F	Fabian.	8 52	20 10	59	17 32	2 0	10 44	17 36					
	21 G	Agnes.	8 55	21 12	0	17 15	2 1	11 45	17 19					
6. xvij.	22 A	Vincent.	8 58	22 13	1	16 58	2 2	12 46	17 2					
	23 B		9 0	23 14	2	16 41	2 3	13 47	16 45					
vj.	24 C		9 2	24 15	3	16 23	2 4	14 48	16 27					
	25 D	Conuers.	9 4	25 16	4	16 5	2 5	15 49	16 9					
3. xliij. 2. iiij.	26 E	of Paul.	9 6	26 17	4	15 47	2 6	16 50	15 54					
ii. iii.	27 F		9 9	27 18	5	15 28	2 7	17 51	15 32					
5. xij.	28 G		9 12	28 19	6	15 9	2 8	18 52	15 13					
xix. 4.	29 A		9 15	29 20	7	14 50	2 9	19 52	14 55					
I. viij.	30 B		9 18	30 21	7	14 31	3 0	20 53	14 35					
	31 C		9 21	31 22	8	14 11	3 1	21 53	14 16					

January hath 31. dayes.

of the Sunne.

⊕ in 3rd yeare.

	D.	M.	D.	M.
1	21	9	21	51
2	22	10	21	41
3	23	12	21	31
4	24	13	21	21
5	25	14	21	10
6	26	15	20	59
7	27	16	20	47
8	28	18	20	35
9	29	19	20	22
10	30	20	20	9
11	1	21	19	57
12	2	22	19	42
13	3	23	19	28
14	4	24	19	14
15	5	25	18	59
16	6	26	18	44
17	7	27	18	28
18	8	28	18	13
19	9	29	17	57
20	10	30	17	40
21	11	31	17	23
22	12	32	17	6
23	13	33	16	49
24	14	34	16	31
25	15	35	16	13
26	16	36	15	55
27	17	37	15	36
28	18	37	15	18
29	19	38	14	59
30	20	39	14	40
31	21	39	14	20

⊕ in 3rd Leape yeare.

	D.	M.	D.	M.
1	20	54	21	54
2	21	55	21	44
3	22	56	21	34
4	23	57	21	24
5	24	59	21	15
6	25	59	21	2
7	27	00	20	50
8	28	2	20	38
9	29	3	20	25
10	30	4	20	12
11	1	5	19	59
12	2	6	19	46
13	3	7	19	32
14	4	8	19	18
15	5	9	19	3
16	6	10	18	48
17	7	11	18	33
18	8	12	18	17
19	9	13	18	1
20	10	14	17	44
21	11	15	17	28
22	12	16	71	11
23	13	17	16	53
24	14	18	16	36
25	15	19	16	18
26	16	19	16	0
27	17	20	15	43
28	18	21	15	23
29	19	24	15	4
30	20	23	14	45
31	21	24	14	27

Certaine of the most notable fixed Starres of the 1. 2. and 3. bignesse , their Magnitude, Declination, and right Ascension : whereby you may readily finde when any of them are in rule for obseruation.

1.

Whales tayle, is a starre of the third bignesse, whose Declination is 20. degr. 12. minutes South, and the right ascension thereof, is 24. minut, of an houre.

2.

Whales backe of the third bignesse, declination 12. degr. 20. minutes South, and right ascension 50. minutes.

3.

Rams horne, is a starre of the third bignesse, whose declination is 17. degrees, 17. minutes North, and his right ascension is 1. houre 32. minutes.

4.

Rams head of the third bignesse, declination 21. degrees 33. minutes North, right ascension 1. houre 40. minutes.

D

February

February hath 28. dayes.

The Prime.			Leng. of the day.	True Place and Declination.							
				⊙ in ☽ First yeare.				⊙ in ☽ seconde yeare.			
				H. M.	D. M.	D. M.		D. M.	D. M.	D. M.	
2. viij.	1 D	Fast.	9 30	1 23	9 13	51		1 22	55	13 56	
7. xvij.	2 E	Purifica. of Mary.	9 33	2 24	10 13	31		2 23	55	13 36	
v.	3 F		9 37	3 25	11 13	9		3 24	56	13 15	
xiii. 12.	4 G		9 41	4 26	11 12	50		4 25	56	12 55	
	5 A	Agathe.	9 45	5 27	12 12	29		5 26	57	13 34	
	6 B		9 50	6 28	12 12	8		6 27	57	12 14	
4. ij.	7 C		9 54	7 29	12 11	48		7 28	58	11 52	
x.	8 D		9 58	8	X 13	11 26		8	29 58	11 31	
	9 E		10 2	9	1 13	11 5		9	X 59	11 10	
8. xvij.	10 F		10 6	10	2 14	10 43		10	1 59	10 49	
2. vij.	11 G		10 9	11	3 14	10 21		11	2 59	10 27	
	12 A		10 12	12	4 14	10 0		12	3 59	10 5	
7. xv.	13 B		10 15	13	5 15	9 37		13	4 59	9 43	
x. iiiij.	14 C	Valent.	10 18	14	6 15	9 15		14	5 59	9 21	
10. iiiij.	15 D		10 22	15	7 15	8 53		15	7 0	8 58	
3. xij.	16 E		10 26	16	8 15	8 30		16	8 0	8 36	
j. 6.	17 F		10 30	17	9 15	8 8		17	9 0	8 14	
	18 G		10 34	18	10 15	7 45		18	10 0	7 51	
5. ix.	19 A		10 38	19	11 16	7 22		19	11 0	7 28	
xvij. 11.	20 B		10 42	20	12 16	6 59		20	12 0	7 5	
	21 C		10 46	21	13 16	6 36		21	13 0	6 42	
	22 D		10 50	22	14 16	6 13		22	14 0	6 19	
3. vj.	23 E	Fast.	10 54	23	15 16	5 50		23	15 0	5 56	
xiii. 11.	24 F	Mathias	10 58	24	16 15	5 27		24	16 0	5 32	
2. iiij.	25 G		11 2	25	17 15	5 4		25	17 0	5 9	
xj. 3.	26 A		11 7	26	18 15	4 40		26	18 0	4 46	
	27 B		11 12	27	19 15	4 16		27	19 0	4 22	
1. xix.	28 C		11 16	28	20 15	3 53		28	20 0	3 58	
	29										

South Declination.

February.

of the Sunne.

○ in ☽ third yeare.

D.	M.	D.	M.
1 22	40	14	0
2 23	41	13	40
3 24	41	13	20
4 25	42	13	0
5 26	42	12	39
6 27	43	12	19
7 28	43	11	58
8 29	44	11	36
9 X	44	11	15
10 I	44	10	54
11 2	45	10	32
12 3	45	10	10
13 4	45	9	48
14 5	46	9	26
15 6	46	9	4
16 7	46	8	41
17 8	46	8	19
18 9	46	7	56
19 10	46	7	33
20 11	47	7	10
21 12	47	6	47
22 13	47	6	24
23 14	47	6	1
24 15	46	5	38
25 16	46	5	15
26 17	46	4	51
27 18	46	4	28
28 19	46	4	4

○ in ☽ Leape yeare.

D.	M.	D.	M.
1 21	56	14	15
2 22	57	13	55
3 23	58	13	35
4 24	59	13	14
5 26	0	12	54
6 27	2	12	33
7 28	3	12	12
8 29	4	11	50
9 X	5	11	26
10 I	6	11	7
11 2	7	10	45
12 3	8	10	23
13 4	9	10	1
14 5	10	9	39
15 6	12	9	16
16 7	13	8	53
17 8	14	8	31
18 9	15	8	8
19 10	16	7	45
20 11	17	7	22
21 12	18	6	58
22 13	19	6	35
23 14	19	6	12
24 15	20	5	48
25 16	21	5	24
26 17	22	5	0
27 18	23	4	37
28 19	23	4	13
29 20	24	3	49

South Declination.

5.

Bulls eye, is a starre of the first bignesse, whose declination is 15. degrees 38. minutes North, and right ascension 4. hours 13. minutes.

6.

Orions left foot, of the first bignesse, declination 8.degrees 42. minutes South, right ascencion 4.hours 55.minutes.

7.

Orions left shoulder, of the second bignes, declination is 5. degrees 56. minutes North, right assencion 5. hours 4.minutes.

8.

Fist in Orions Girdle, of the second bignes, declination 38. minutes South, right ascencion, 5.hours, 12.minutes.

9

Orions right shoulde, of the first bignesse, declination 6. degrees 17. minutes North, right ascencion 6. hours 34. minutes.

March hath 31. dayes.

The Prime.		Leng. of the day.	True Place and Declination.					
			○ in ♀ First yeere.			○ in ♀ Second yeere.		
			H. M.	D. M.	D. M.	D. M.	D. M.	D. M.
	1 D	Dauid.	11 20	1 21 14	3 29	1 21 0	3 35	
7. viii.	2 E		11 24	2 22 14	3 6	2 21 59	3 11	
xvij. II.	3 F		11 28	3 23 13	2 42	3 22 59	2 48	
	4 G		11 32	4 24 13	2 18	4 23 59	2 24	
	5 A		11 36	5 25 13	1 54	5 24 58	2 0	
10. v.	6 B		11 40	6 26 12	1 30	6 25 58	1 37	
I. xiii. ii. 6	7 C		11 44	7 27 12	1 7	7 26 57	1 13	
	8 D		11 48	8 28 11	0 43	8 27 57	0 49	
8. x.	9 E		11 52	9 29 01	0 20	9 28 56	0 26	
xvij. 7.	10 F	Gregor.	11 56	10 0	0 4	10 29 55	0 2	
	11 G		12 0	1 1	1 9	1 1 55	0 23	
	12 A		12 4	1 2	2 8	1 2 54	0 45	
8. viij.	13 B		12 8	1 3	3 8	1 3 53	1 9	
xv. 9.	14 C		12 12	1 4	4 7	1 4 53	1 31	
	15 D		12 16	1 5	5 6	1 5 4 52	1 56	
iiiij.	16 E		12 20	1 6	6 5	1 6 5 51	2 20	
xij. 6.	17 F		12 24	1 7	7 4	1 7 6 50	2 43	
	18 G	Edward.	12 28	1 8	8 4	1 8 7 49	3 7	
5. j.	19 A		12 32	1 9	9 3	1 9 8 48	3 30	
ix. 10.	20 B	Benedic.	12 36	2 0	10 2	2 0 9 47	3 53	
	21 C		12 40	2 1	11 0	2 1 10 46	4 17	
xvij. 6.	22 D		12 43	2 2	11 58	2 2 11 45	4 40	
vij. 11.	23 E		12 47	2 3	12 58	2 3 12 44	5 3	
I. xiiiij.	24 F	Fast.	12 50	2 4	13 57	2 4 13 43	5 26	
vij. 8.	25 G	Anaun-	12 54	2 5	14 56	2 5 14 42	5 49	
	26 A	ciation	12 48	2 6	15 55	2 6 15 41	6 12	
	27 B	of Mary.	13 22	7 16	53	2 7 16 40	6 34	
9. xij.	28 C		13 6	28 17	52	2 8 17 38	6 56	
xij. 3.	29 D		13 12	29 18	51	2 9 18 36	7 19	
	30 E		13 18	30 19	49	3 0 19 35	7 41	
vij. 10.	31 F		13 24	31 20	48	3 1 20 34	8 4	

March.

of the Sunne.

○ in ♀ third year.		○ in ♀ Leape year.	
D.	M.	D.	M.
1	20 45	3	41
2	21 45	3	17
3	22 45	2	53
4	23 44	2	30
5	24 44	2	6
6	25 43	1	42
7	26 43	1	19
8	27 42	0	55
9	28 42	0	31
10	29 41	0	8
11	♀ 40 0	16	
12	1 40 0	40	
13	2 39	1	3
14	3 38	1	27
15	4 37	1	50
16	5 37	2	14
17	6 35	2	37
18	7 35	3	1
19	8 34	3	25
20	9 33	3	48
21	10 32	4	11
22	11 31	4	34
23	12 30	4	57
24	13 29	5	20
25	14 28	5	43
26	15 26	6	6
27	16 25	6	29
28	17 24	6	52
29	18 23	7	14
30	19 21	7	36
31	20 20	7	58

South Declination.

North Declination.

10.

The great Dog, is a Starre
of the first bignesse, whose De-
clination is 16. degrēs 12.
minutes Southwards, and his
right ascension 6. oures 27.
minutes.

11.

The little Dog is a Starre
of the the first bignesse, Decli-
nation is 6.degr 13. minutes
north, right ascension 7. hours
18. minutes.

12.

Brightest in Hydra, is a
Starre of the second bignesse,
Declination 6. degr. 93. min
South, right ascension 9.hour.
8. minutes.

13.

Lyons heart , - of the first
bignesse , declination 13. deg.
55. minutes North , right as-
cension 9. oures 57. minut.

14.

Lyons necke , of the second
bignesse, declination 21. deg.
52. minut. North, right ascen-
sion 9. oures 46. minutes.

Aprill hath 30. dayes.

The Prime.			Leng. of the day.	True Place and Declination.			
				○ in V First yeare,	○ in V second yeare,	D. M. D. M.	D. M. D. M.
xvj. 4.	1 G		13 30	1 21 46	8 31	1 21 33	8 25
	2 A		13 34	2 22 41	8 53	2 22 31	8 48
	3 B		13 38	3 23 44	9 15	3 23 30	9 9
v.	4 C	Ambros	13 42	4 24 42	9 36	4 24 28	9 31
xij. 8.	5 D		13 46	5 25 41	9 58	5 25 27	9 53
7. ij.	6 E		13 50	6 26 39	10 19	6 26 25	10 14
x. 5.	7 F		13 53	7 27 37	10 40	7 27 23	10 35
	8 G		13 56	8 28 36	11 1	8 28 22	10 56
2. xvij.	9 A		13 59	9 29 34	11 22	9 29 20	11 17
	10 B		14 2	10 8 32	11 42	10 8 18	11 37
vij. 8.	11 C		14 5	11 1	12 3	11 1	11 58
	12 D		14 8	12 2 29	12 22	12 2 15	12 18
2. xv.	13 E		14 12	13 3 27	12 43	13 3 13	13 38
iiiij. 8.	14 F		14 15	14 4 25	13 2	14 4 11	12 58
	15 G		14 20	15 5 24	13 22	15 5 9	13 17
9. xij.	16 A		14 24	16 6 23	13 42	16 6 8	13 37
j. 9.	17 B		14 28	17 7 20	14 1	17 7 6	13 56
	18 C		14 32	18 8 18	14 19	18 8 4	14 15
ix. 2.	19 D		14 36	19 9 16	14 38	19 9 3	14 34
	20 E		14 40	20 10 14	14 56	20 10 0	14 58
2. xvij.	21 F		14 44	21 11 12	15 15	21 10 58	15 12
vj.	22 G		14 47	22 12 10	15 33	22 11 56	15 28
xiiij. 8.	23 A	S. Geor.	14 50	23 13 8	15 50	23 12 54	15 46
	24 B	Fast.	14 53	24 14 7	16 8	24 13 51	16 3
7. iiij.	25 C	S. Mark.	14 56	25 15 3	16 25	25 14 49	16 20
xj. 2.	26 D		14 59	26 16 2	16 42	26 15 47	16 37
	27 E		15 2	27 16 59	16 58	27 16 45	16 54
7. xix.	28 F		15 5	28 17 56	17 14	28 17 43	17 11
	29 G		15 8	29 18 54	17 30	29 18 40	17 26
vij. 2.	30 A		15 12	30 19 52	17 47	30 19 38	17 42

North Declination.

Aprill.

of the Sunne.

○ in V third yeare.

D.	M.	D.	M.
1	31	18	8 20
2	22	17	8 42
3	23	16	9 4
4	24	14	9 26
5	25	13	9 47
6	26	11	10 9
7	27	10	10 30
8	28	8	10 51
9	29	6	11 12
10	8	4	11 32
11	1	3	11 53
12	2	1	12 13
13	2	59	12 33
14	3	57	12 53
15	4	55	13 11
16	5	54	13 32
17	6	52	13 51
18	7	50	14 10
19	8	48	14 29
20	9	46	14 48
21	10	44	15 6
22	11	42	15 24
23	12	39	15 41
24	13	37	15 59
25	14	35	16 16
26	15	33	16 33
27	16	31	16 49
28	17	29	17 7
29	18	26	17 23
30	19	24	17 38

North Declination.

○ in V Leape yeare.

D.	M.	D.	M.
1	22	3	8 37
2	23	1	8 59
3	24	0	9 21
4	24	58	9 42
5	25	57	10 3
6	26	55	10 25
7	27	54	10 46
8	28	52	11 7
9	29	50	11 27
10	8	49	11 48
11	1	47	12 8
12	2	45	12 28
13	3	43	12 48
14	4	41	13 7
15	5	39	13 27
16	6	38	13 47
17	7	36	14 6
18	8	34	14 25
19	9	32	14 43
20	10	30	15 1
21	11	28	15 20
22	12	26	15 37
23	13	24	15 55
24	14	21	16 12
25	15	19	16 29
26	16	17	16 46
27	17	15	17 3
28	18	13	17 19
29	19	10	17 35
30	20	8	17 50

15.

Lyons backe, is a Starre of the second bignesse, whose declination is 22. degrees 43. minutes Northward, and his right ascension is 10. hours, 52. minutes.

16.

Lyons tayle, of the first bignesse, declination 16. degrees 50. minutes North, right ascension 11. hours 26. minutes.

17.

Rauens wing, of the third bignesse, declination 15. degrees 50. minutes South, right ascension 11. hours 56.minutes.

18.

Virgins spike, of the first bignesse declination 9. degrees South, right ascension 13. hours 5. minutes.

D 4 May

May hath 31. dayes.

The Prime.	Fast.	Leng. of the day.	H. M.	True Place and Declination.			
				○ in First & yeere		○ in & second yere.	
				D. M.	M.	D. M.	M.
iiij. viij.	1 B Phil.and	15 16	15 16	1 20 50	18 2	1 20 36	17 58
6. xvij.	2 C Iacob.	15 20	15 20	2 21 47	18 17	2 21 34	18 13
9. v.	3 D Inuent.	15 23	15 23	3 22 45	18 32	3 22 31	18 28
	4 E Crosse.	15 26	15 26	4 23 43	18 46	4 23 29	18 43
8. xiii. ii.	5 F	15 39	15 39	5 24 40	19 0	5 24 26	18 57
	6 G Ioh.por.	15 32	15 32	6 25 38	19 14	6 25 24	19 11
4. x.	7 A Latin.	15 5	15 5	7 26 35	19 28	7 26 22	19 25
	8 B	15 38	15 38	8 27 33	19 41	8 27 19	19 38
xvij. 9.	9 C	15 40	15 40	9 28 30	19 54	9 28 17	19 51
	10 D	15 42	15 42	10 29 28	20 7	10 29 14	20 3
3. viij.	11 E	15 44	15 44	11 II 25	20 19	11 II 12	20 16
xv. 8.	12 F	15 46	15 46	12 I 23	20 31	12 I 10	20 28
	13 G	15 48	15 48	13 II 20	20 42	13 2	6 20 39
8. iiiij.	14 A	15 50	15 50	14 III 18	20 53	14 3	4 20 51
xij.	15 B	15 53	15 53	15 IV 15	21 4	15 4	1 21 2
	16 C	15 56	15 56	16 V 12	21 15	16 4	5 21 12
	17 D	15 58	15 58	17 VI 10	21 25	17 5	56 21 22
j.	18 E	16 0	18	7 7 21	35	18 6	53 21 32
6. ix.	19 Dunstan	16 0	19	8 5 21	44	19 7	51 21 32
xvij. xi.	20 G	16 6	20	9 2 21	53	20 8	48 21 51
vj. 8.	21 A	16 9	21	9 59 22	2	21 9	45 32 0
	22 B	16 12	22	10 55 32	10	22 10	43 22 8
8. xliij.	23 C	16 14	23	11 54 22	18	23 11	4 22 15
iiij. i.	24 D	16 16	24	12 51 22	25	24 12	37 22 23
	25 E	16 18	25	13 48 22	32	25 13	35 22 31
10. xij.	26 F	16 20	26	14 45 22	39	26 14	32 22 37
6. xix.	27 G	16 23	27	15 43 22	45	27 15	29 22 44
	28 A	16 24	28	16 40 22	51	28 16	26 22 50
	29 B	16 26	29	17 37 22	57	29 17	24 22 56
8. viij.	30 C	16 27	30	18 34 23	2	30 18	20 23 1
xvij. 6.	31 D	16 28	31	19 31 23	7	31 19	18 23 6

August.

May.

of the Sunne.

O in ♀ third yeare.				O in ♀ Leape yeare.			
D.	M.	D.	M.	D.	M.	D.	M.
1 20	22	17	54	1 21	6	18	6
2 21	20	18	30	2 22	3	18	21
3 22	13	18	24	3 23	1	18	36
4 23	16	18	39	4 24	58	18	50
5 24	13	18	54	5 24	56	19	4
6 25	10	19	8	6 25	54	19	18
7 26	8	19	21	7 26	52	19	32
8 27	5	19	35	8 27	49	19	45
9 28	3	19	48	9 28	46	19	57
10 29	0	20	0	10 29	44	20	10
11 29	58	20	13	11 III	41	20	22
12 II	55	20	25	12	1	39	20
13 I	53	20	37	13	2	36	20
14 2	50	20	48	14	3	33	20
15 3	47	21	59	15	4	31	20
16 4	45	21	10	16	5	29	21
17 5	42	21	20	17	6	26	21
18 6	39	21	30	18	7	23	21
19 7	37	21	40	19	8	20	21
20 8	34	21	49	20	9	18	21
21 9	32	21	58	21	10	15	22
22 10	29	22	6	22	11	12	23
23 11	25	22	14	23	12	9	22
24 12	23	22	22	24	13	7	22
25 13	21	22	39	25	14	4	22
26 14	18	22	36	26	15	1	22
27 15	15	22	42	27	15	58	22
28 16	12	22	48	28	16	56	22
29 17	10	22	54	29	17	53	22
30 18	7	23	59	30	18	50	2
31 19	4	23	4	31	19	47	3

North Declination.

19.

Arcturus or betwixt bootes
thighes, is a starre of the first
bignesse, whose declination is,
21. degrees 20. min. North,
and his right ascension is 13.
houres 55. minutes.

20.

South Balance, of the se-
cond bignesse, Declination
14.degrees 14.minut.South,
right ascension 14.houres 30.
minutes.

21.

North Balance, of the se-
cond bignesse, declination 7.
degrees 46. minutes South,
right ascension 14. houres
55. minutes.

22.

Scorpions heart, is a starre
of the first bignesse, whose de-
clination is 25. degrees, 25.
minutes South, right ascensi-
on 16.houres 6. minutes.

June

Iune hath 30. dayes.

The Prime.			Leng. of the day.	True Place and Declination.							
				⊙ in II First yeere.				⊙ in III second yere.			
				H. M.	D. M.	D. M.		D. M.	D. M.		
8.v.	1 E		16 28	1 20	29	23	11	1 20	15	23	10
	2 F		16 28	2 21	26	23	15	2 21	12	23	14
1. xij.	3 G		16 29	3 22	23	23	18	3 22	9	23	17
7.ij.	4 A		16 29	4 23	20	23	21	4 23	6	23	21
x. 10.	5 B	Bonifac.	16 29	5 24	17	23	24	5 24	4	23	23
	6 C		16 29	6 25	14	23	26	6 25	1	23	26
xvij. 6.	7 D		16 30	7 26	11	23	28	7 25	58	23	28
	8 E		16 30	8 27	9	23	30	8 26	55	23	29
vij. 8.	9 F		16 30	9 28	6	23	31	9 27	52	23	30
	10 G		16 30	10 29	3	23	31	10 28	49	23	31
9.xv.	11 A	Barnaby	16 30	11 30	0	23	31	11 29	46	23	31
11. iiij.	12 B		16 30	12	5	57	23	31	12 5	43	23
xij. 10.	13 C		16 30	13	1	54	23	31	13 1	40	23
	14 D		16 30	14	2	51	23	30	14 2	38	23
	15 E		16 30	15	3	48	23	28	15 3	35	23
9.j.	16 F		16 30	16	4	45	23	26	16 4	32	23
ix. 9.	17 G		16 39	17	5	42	23	24	17 5	29	23
	18 A		16 29	18	6	38	23	21	18 6	26	23
xvij. 2.	19 B		16 28	19	7	37	23	18	19 7	23	23
8.vj.	20 C	Edward	16 27	20	8	34	23	15	20 8	20	23
xiiiij.	21 D		16 26	21	9	31	23	11	21 9	17	23
ijj. 11.	22 E		16 25	22	10	28	23	7	22 10	14	23
	23 F	Faſt.	16 24	23	11	25	23	2	23 11	11	23
xij. 3.	24 G	John Ba	16 23	24	12	22	22	57	24 12	8	22
	25 A		16 22	25	13	19	22	51	25 13	6	22
3. xix.	26 B		16 20	26	14	16	23	45	26 14	3	22
	27 C		16 18	27	15	14	22	39	27 15	0	22
vij. 4.	28 D	Faſt.	16 16	28	16	11	22	32	28 15	57	22
	29 E	St. Peter	16 14	29	17	8	22	25	29 16	54	22
8. xvij.	30 F		16 13	30	18	5	22	18	30 17	51	22

June.

of the Sunne.

in II third yeare.	in II Leape yeare.
D. M.	D. M.
1 20 2 23 9	1 20 44 23 12
2 20 58 23 13	2 21 42 23 16
3 21 55 23 17	3 22 40 23 19
4 22 53 23 20	4 23 36 23 22
5 23 50 23 23	5 24 33 23 25
6 24 47 23 25	6 25 30 23 27
7 25 44 23 27	7 26 27 23 29
8 26 41 23 29	8 27 24 23 30
9 27 38 23 30	9 28 21 23 30
10 28 35 23 31	10 29 19 23 31
11 29 32 23 31	11 29 17 23 31
12 2 30 23 31	12 1 13 23 31
13 1 27 23 31	13 2 10 23 30
14 2 24 23 30	14 3 7 23 29
15 3 21 23 29	15 4 4 23 28
16 4 18 23 27	16 5 1 23 26
17 5 15 23 25	17 5 58 23 23
18 6 12 23 23	18 6 55 23 21
19 7 9 23 20	19 7 52 23 17
20 8 6 23 17	20 8 49 23 14
21 9 2 23 13	21 9 47 23 10
22 10 0 23 9	22 10 45 23 5
23 10 58 23 4	23 11 41 23 0
24 11 55 23 59	24 12 38 22 55
25 12 52 22 54	25 13 35 22 50
26 13 49 22 48	26 14 32 22 44
27 14 46 22 43	27 15 29 22 37
28 15 43 22 36	28 16 26 22 31
29 16 40 22 29	29 17 23 22 23
30 17 37 22 23	30 18 21 22 16

Hercules head, is a Starre
of the third bignes, whose
Declination is 14. degrees
57. minuts North, and right
ascension 16. houres 57.
minutes.

23.

Eagles heart, is a Starre
of the second bignes, Decli-
nation 17. degrees 54. min.
North, right ascension 19.
houres 32. minutes.

24.

Dolphins tayle , of the
third bignesse , declination
10. degrees North , right
ascension 20. houres , 16.
minutes.

25.

Goates tayle, of the third
bignes, declination 17. de-
grees 51. minutes South,
right ascension 21. houres
37. minutes.

July.

July hath 31. dayes.

The Prime.			Leng. of the day.	True Place and Declination.					
				in ☽ First yeare.			in ☽ second yeare.		
				H. M.	D. M.	D. M.	D. M.	D. M.	D. M.
2. v.	1 G	Visitati.	16 12	1 19 2	2 22 10		1 18 48	22 12	
xij. 8.	2 A	Mary.	16 10	2 19 59	2 2 2		2 19 45	22 4	
ij. 7.	3 B	Martin.	16 8	3 20 56	2 1 53		3 20 43	21 55	
	4 C		16 6	4 21 53	2 1 44		4 21 40	21 46	
x.	5 D		16 4	5 22 51	2 1 35		5 22 37	21 37	
	6 E		16 1	6 23 48	2 1 25		6 23 34	21 28	
4. xvij.	7 F		15 57	7 24 45	2 1 15		7 24 31	21 18	
	8 G		15 54	8 25 42	2 1 5		8 25 29	21 7	
9. vij.	9 A		15 51	9 26 39	20 54		9 26 26	20 56	
xv.	10 B		15 48	10 27 37	20 43		10 27 23	20 45	
iiij. 8.	11 C		15 46	11 28 35	20 31		11 28 20	20 34	
	12 D		15 44	12 29 31	20 19		12 29 17	20 22	
3. xij.	13 E		15 41	13 32	28 20	7	13 32	20 10	
	14 F		15 38	14 1	26 19	55	14 1	19 58	
6. j.	15 G	Swithin	15 35	15 2	23 19	42	15 2	9 19 45	
	16 A		15 32	16 3	20 19	29	16 3	7 19 32	
2. ix.	17 B		15 29	17 4	18 19	15	17 4	4 19 18	
xvij. 10.	18 C		15 26	18 5	15 19	1	18 5	1 19 5	
vj.	19 D	Dog.d.b	15 23	19 5	59 19	47	19 5	59 18 51	
xiij. 8.	20 E	Margar.	15 20	20 7	10 18	33	20 6	56 18 36	
	21 F		15 17	21 8	7 18	18	21 7	53 18 22	
iij.	22 G	Magdal.	15 13	22 9	4 18	3	22 8	51 18 7	
	23 A		15 10	23 10	2 17	48	23 9	48 17 51	
6. xi.	24 B	Fast.	15 8	24 10	59 17	32	24 10	46 17 36	
xix. 11.	25 C	S. James	15 5	25 11	57 17	16	25 11	43 17 20	
	26 D	Anna.	15 3	26 12	54 17	0	26 12	40 17 4	
	27 E		15 0	27 13	52 16	43	27 13	38 16 47	
9. viii.	28 F		14 57	28 14	49 16	27	28 14	35 16 31	
xvj.	29 G		14 55	29 15	47 16	10	29 15	33 16 14	
v. 7.	30 A		14 52	30 16	44 15	52	30 16	31 15 57	
	31 B		14 50	31 17	42 15	35	31 17	28 15 39	

North Declination.

July.

of the Sunne.

in the third yeare.		in the Leape yeare	
D.	M.	D.	M.
1	18 34	22 14	1 19 17 22 8
2	19 32	22 6	2 20 15 22 0
3	20 29	21 57	3 21 12 21 51
4	21 26	21 49	4 22 9 21 42
5	22 23	21 40	5 23 7 21 32
6	23 20	21 30	6 24 4 21 22
7	24 17	21 20	7 25 0 21 12
8	25 15	21 10	8 25 58 21 2
9	26 12	20 59	9 26 55 20 51
10	27 9	20 48	10 27 53 20 40
11	28 6	20 37	11 28 50 20 28
12	29 4	20 25	12 29 47 20 16
13	30 1	20 13	13 30 44 20 4
14	0 55	20 2	14 1 42 19 51
15	1 53	19 49	15 2 39 19 38
16	2 50	19 36	16 3 36 19 25
17	3 47	19 22	17 4 33 19 12
18	4 45	19 9	18 5 31 18 58
19	5 42	18 55	19 6 28 18 43
20	6 39	18 41	20 7 26 18 29
21	7 37	18 26	21 8 23 18 14
22	8 34	18 11	22 9 20 17 59
23	9 32	17 57	23 10 18 17 43
24	10 30	17 40	24 11 15 17 28
25	11 27	17 34	25 12 13 17 12
26	12 20	17 9	26 13 10 16 56
27	13 22	16 50	27 14 8 16 39
28	14 19	16 36	28 15 5 16 22
29	15 17	19 19	29 16 3 16 5
30	16 14	16 2	30 17 0 15 48
31	17 12	15 44	31 17 58 15 30

North Declination.

27.
Pegasus Shoulder, of the 2nd bignesse, declination 12. degr. 58. min. North, right ascension 22. hours, 46. minutes.

28.
Pegasus Leg, of the third bignesse, declination 25. deg. 58. minutes North, right ascension 22. hours 44. minutes.

29.
Swans Tayle, is a Starre of the second bignesse, whose Declination is 43. deg. 54. min. North, right ascension 20. hours 30. minutes.

30.
The Waggoners right shoulder, is a Starre of the second bignesse, Declination 43. degrees 49. minutes North and right ascension 5. hours 30. minutes.

31.
Hircus the Osate, of the first bignesse, declination 45. degrees 30. minutes, right ascension, 4. hours, 49. minutes.

32.
Lyra of the first bignesse, North Declination 38. degr. 30. minutes, right ascension 18. hours, 20. minutes.

August

August hath 31. dayes.

The Prime.			Leng. of the day.	True Place and Declination.								
				in ♐ First yeere.				in ♐ second yeere.				D. M.
				H. M.	D. M.	D. M.		D. M.	D. M.			
6.xiii.	1	C	Lammas.	14 46	1	18 40	15 17		1	18 26	15 21	
2.ij.	2	D		14 42	2	19 37	14 56		2	19 23	15 4	
	3	E		14 38	3	20 35	14 41		3	20 21	14 45	
7. x.	4	F		14 34	4	21 33	14 22		4	21 19	14 27	
xvij. 9.	5	G		14 40	5	22 30	14 4		5	22 17	14 8	
	6	A		14 36	6	23 28	13 45		6	23 14	13 49	
vij.	7	B		14 32	7	24 26	13 25		7	24 11	13 30	
xv. 7.	8	C		14 28	8	25 24	13 5		8	25 10	13 10	
	9	D		14 23	19	26 21	12 47		9	26	8 12	51
5. iiij.	10	E	Lawrem.	14 16	10	27 19	12 27		10	27	5 12	32
xij. 11.	11	F		14 9	11	28 17	12 7		11	28	3 12	12
	12	G		14 6	12	29 15	11 47		12	29	1 11	51
	13	A		14 3	13	30	13 27		13	29	56	11 31
3.j.	14	B		14 0	14	1	11 11	6	14	30	57	11 11
ix. 12.	15	C		13 56	15	2	9 10	45	15	1	55	10 51
	16	D		13 52	16	3	7 10	24	16	2	53	10 29
vj. 7. xvij.	17	E		13 50	17	4	5 10	3	17	3	51	10 8
	18	F		13 44	18	5	3	9 42	18	4	49	9 47
9. xiiiij.	19	G		13 40	29	6	1	9 20	19	5	47	9 25
	20	A		13 35	20	6	59	8 59	20	6	45	9 4
8. iiij.	21	B		13 30	21	7	57	8 37	21	7	43	8 42
xj. 9.	22	C		13 25	22	8	55	8 15	22	8	41	8 21
	23	D	Fast.	13 20	23	9	55	7 53	23	9	40	7 58
xix. 4.	24	E	Barthol.	13 15	24	10	51	7 31	24	10	36	7 37
	25	F	Apostle.	13 10	25	11	50	7 9	25	11	34	7 15
vlij.	26	G		13 6	26	12	48	6 47	26	12	33	6 52
xvj. 8.	27	A		13 2	27	13	46	6 24	27	13	31	6 30
	28	B		12 58	28	14	44	6 2	28	14	29	6 8
7.v.	29	C	Behead.	12 54	29	15	43	5 39	29	15	28	5 45
xiiij. 5.	30	D	of Iohn.	12 51	30	16	42	5 16	30	16	26	5 22
	31	E		12 48	31	17	40	4 53	31	17	25	4 56

August.

of the Sunne.

○ in ♀ third yeare.

	D.	M.	D.	M.
1	18	12	15	26
2	19	9	15	8
3	20	7	14	50
4	21	5	14	31
5	22	2	14	13
6	23	0	13	54
7	23	58	13	35
8	24	56	13	15
9	25	53	12	56
10	26	51	12	36
11	27	49	12	16
12	28	47	11	56
13	29	45	11	36
14	30	43	11	16
15	1	41	10	55
16	2	39	10	34
17	3	37	10	13
18	4	35	9	52
19	5	33	9	31
20	6	31	9	9
21	7	29	8	48
22	8	27	8	26
23	9	25	8	4
24	10	23	7	42
25	11	22	7	20
26	12	20	6	57
27	13	19	6	35
28	14	17	6	12
29	15	15	5	50
30	16	14	5	27
31	17	12	5	4

North Declination.

	D.	M.	D.	M.
1	18	56	15	12
2	19	54	14	54
3	20	51	14	36
4	21	48	14	17
5	22	46	13	59
6	23	44	13	39
7	24	42	13	20
8	25	40	13	1
9	26	37	12	41
10	27	35	12	21
11	28	33	12	1
12	29	31	11	41
13	30	29	11	20
14	1	27	11	0
15	2	25	10	39
16	3	23	10	18
17	4	21	9	57
18	5	19	9	36
19	6	17	9	14
20	7	15	8	53
21	8	13	8	31
22	9	11	8	9
23	10	9	7	47
24	11	8	7	25
25	12	6	7	3
26	13	5	6	49
27	14	3	6	18
28	15	1	5	55
29	15	59	5	33
30	16	58	5	10
31	17	56	4	47

33.
Perseus right side of the second bignesse , declination 47° deg. North, right ascension 22. hours 56. minutes.

34.
Fomahand, is a starre of the first bignes, hauing South Declination 33.deg.15.min. and right ascension 22.hours 40. minutes,

35.
In the knee of Sagitarius, is a starre of the second bignesse, hauing South declination 42. degr. and right ascension 18. hours 44. minutes.

Starres neere about the North Pole , with their distance from the sayd Pole.

1.
The Pole starre is of the third bignesse , whose distance from the Pole is 2. degr. 52. min. and his right ascension is 50. minutes.

2.
The formost Guard, of the 2. bignesse, distant from the Pole 14. degr. 11. min. right ascension 14. hou. 54. min.

3.
The hindermost Guard of the 2. bignes, distant 16. deg. 42. min. right assencion 15. hours 26. minutes.

Septem-

September hath 30. dayes.

The Prime.			Leng. of the day.	True Place and Declination.												
				in the First yeare.						in the second yeare.						
				H. M.	D. M.	D. M.	H. M.	D. M.	D. M.	H. M.	D. M.	D. M.	H. M.	D. M.	D. M.	
12. ii.	1 F	Giles.	12 48	1 18 39	4 30		1 18 24	4 36								
3. 8.	2 G		12 44	2 19 37	4 7		2 19 23	4 13								
.	3 A		12 40	3 20 36	3 44		3 20 20	3 50								
3. xvij.	4 B		12 36	4 21 35	3 21		4 21 20	3 27								
vij. 7.	5 C	Dog day	12 32	5 22 33	2 58		5 22 19	3 4								
	6 D	end.	12 28	6 23 32	2 35		6 23 18	2 40								
9. xv.	7 E	Nat. Eli.	12 24	7 24 31	2 11		7 24 16	2 17								
iiiij. 9.	8 F	Nat. Ma.	12 20	8 25 29	1 48		8 25 15	1 34								
	9 G		12 16	9 26 28	1 27		9 26 13	1 31								
2. xii.	10 A		12 12	10 27	27 1	1	10 27 12	1 7								
	11 B		12 8	11 28	26 0	38	11 28 11	0 43								
i. xi.	12 C		12 4	12 39	25 0	14	12 29 19	0 20								
	13 D		12 0	13 1	24 0	10	13 19	9 0								
2. ix.	14 E	Hol. Cr.	11 56	14	1 23	0 33	14 1	8 0	27							
xvii. 8.	15 F		11 52	15	2 21	0 56	15 2	7 0	51							
8. vi.	16 G		11 48	16	3 20	1 20	16 3	6 1	14							
xiiiij. 2.	17 A	Lambar.	11 44	17	4 19	1 43	17 4	5 1	38							
	18 B		11 40	18	5 18	2 7	18 5	4 2	3							
iiij. 7.	19 C		11 36	19	6 18	2 31	19 6	3 2	25							
	20 D	Fast.	11 32	20	7 17	2 54	20 7	2 2	48							
xi. 2.	21 E	Matth.	11 28	21	8 16	3 17	21 8	1 3	11							
	22 F		11 24	22	9 15	3 41	22 9	0 3	35							
3. xix.	23 G		11 20	23	10 15	4 4	23 10	0 3	58							
viii. 9.	24 A		11 16	24	11 14	4 28	24 10	5 4	2							
	25 B	Ciprian	11 12	25	12 13	4 51	25 11	5 4	4							
8. xvi.	26 C		11 8	26	13 13	5 14	26 12	5 8	5							
v. 5.	27 D		11 4	27	14 12	5 37	27 13	5 8	5							
	28 E	Fast.	11 0	28	15 12	6 0	28 14	5 7	5							
4. xiii.	29 F	S. Mich.	10 56	29	16 11	6 23	29 15	5 7	6							
ii. 6.	30 G	Hierom.	10 52	30	17 11	6 46	30 16	5 6	41							

September.

of the Sunne.

○ in the third yeare.				○ in the Leape yeare.			
D.	M.	D.	M.	D.	M.	D.	M.
1	18	11	4 41	1	18	55	4 24
2	19	9	4 19	2	19	53	4 1
3	20	8	3 55	3	20	52	3 38
4	21	6	3 32	4	21	51	3 15
5	22	5	3 9	5	22	49	2 52
6	23	3	2 46	6	23	48	2 28
7	24	2	2 23	7	24	47	2 5
8	25	1	1 59	8	25	46	1 41
9	26	0	1 36	9	26	45	1 18
10	26	58	1 13	10	27	43	0 55
11	27	57	0 49	11	28	42	0 31
12	28	56	0 26	12	29	41	0 9
13	29	55	0 2	13	40	0 16	
14	4	54	0 22	14	1	39	0 49
15	1	53	0 45	15	2	38	1 3
16	2	52	1 9	16	3	37	1 27
17	3	51	1 32	17	4	36	1 50
18	4	50	1 56	18	5	35	2 14
19	5	49	2 19	19	6	34	2 37
20	6	48	2 43	20	7	33	3 0
21	7	47	3 6	21	8	32	3 24
22	8	47	3 30	22	9	32	3 47
23	9	46	3 53	23	10	31	4 11
24	10	45	4 16	24	11	30	4 34
25	11	45	4 40	25	12	30	4 57
26	12	44	5 3	26	13	29	5 20
27	13	43	5 26	27	14	29	5 44
28	14	43	5 49	28	15	28	6 7
29	15	2	6 42	29	16	27	6 26
30	16	42	6 35	30	17	27	6 52

North Declination.

South Declination.

4.

The end of the Dragons
taille of the third bignesse, di-
stant from the Pole 18. degr.
26. minutes, right ascension
11. hours, 8. minutes.

5.

The great Beares backe of
the second bignesse, distant
from the Pole 26. degrees 5.
minutes right ascension 10.
hours 40. minutes.

6.

Cepheus right shoulder, of
the third bignesse, distant 29.
degrees, right ascension 21.
hours 10. minutes.

7.

The great Beares side, of
the second bignesse, distant 31.
degr. 26. minutes, right ascen-
sion 10. hours 58. minutes.

8.

The first in her taille of the
second bignesse distant 31. de-
gres 49. min. right ascension
12. hours, 32. minutes.



October

October hath 31. dayes.

The Prime.							True Place and Declination.						
							○ in ≈ First yeare			○ in ≈ Second yeare			
							H. M.	D.	M.	D.	M.	D.	M.
2. x.	1 A			10 48	1	18 10	7	9		1	17 56	7	4
xviii. 10	2 B			10 44	2	19 10	7	32		2	18 55	7	36
	3 C			10 40	3	20	9	7 54		3	19 55	7	49
	4 D			10 36	4	21	9	8 17		4	20 55	8	12
8.vij.	5 E	Faith.		10 32	5	22	9	8 39		5	21 54	8	34
xv.	6 F			10 28	6	23	9	9 2		6	22 54	8	56
	7 G			10 24	7	24	8	9 24		7	23 54	9	18
iiiij. 1.	8 A	Denis.		10 20	8	25	8	19 46		8	24 54	9	40
	9 B			10 16	9	26	8	10 8		9	25 54	10	2
4.xij.	10 C			10 12	10	27	8	10 29		10	26 53	10	24
	11 D			10	8	11 28	8	10 51		11	27 53	10	46
j.	12 E			10	4	12 29	8	11 12		12	28 53	11	7
ix. 10.	13 F	Edward		10	0	13 m	8	11 34		13	29 53	11	28
xvij. 17.	14 G			9 56	1	14	8	11 55		14	m	11	49
vj. 3.	15 A			9 52	1	15	2	8 12 15		15	1 53	12	11
	16 B	Fast.		9 48	1	16	3	8 12 36		16	2 54	12	31
8. xiiij.	17 C	Luke.		9 44	1	17	4	8 12 57		17	3 54	12	52
	18 D			9 40	1	18	5	8 13 17		18	4 54	13	11
iiij.	19 E			9 36	1	19	6	9 13 37		19	5 54	13	52
	20 F			9 32	2	20	7	9 13 57		20	6 54	14	12
6.xi.	21 G			9 28	2	21	8	9 14 16		21	7 55	14	31
xix. 8.	22 A			9 24	2	22	9	10 14 36		22	8 55	14	50
	23 B			9 20	2	23	10	10 14 55		23	9 55	14	50
7. vij.	24 C	Crispin.		9 17	2	24	11	10 15 14		24	10 56	15	10
xvj. 2.	25 D			9 14	2	25	12	11 15 33		25	11 56	15	28
	26 E			9 10	2	26	13	11 15 51		26	12 56	15	47
4.ye.	27 F	Fast.		9 7	2	27	14	12 16 9		27	13 57	16	5
	28 G	Simon		9 4	2	28	15	12 16 27		28	14 57	16	23
xi. xiiij.	29 A	& Iude.		9 0	2	29	16	13 16 45		29	15 58	16	41
2.iij.	30 B			8 56	3	30	17	13 17 2		30	16 58	16	58
x. xi.	31 C			8 52	3	31	18	14 17 19		31	17 59	17	15

South Declination.

October.

of the Sunne.

	D. M. D. M.		D. M. D. M.	
1	17	41	6	58
2	18	41	7	21
3	19	41	7	44
4	20	40	8	6
5	21	40	8	28
6	22	40	8	51
7	23	39	9	13
8	24	39	9	38
9	25	39	9	57
10	26	39	10	19
11	27	39	10	41
12	28	39	11	2
13	29	39	11	23
14	m	39	11	44
15	1	39	12	5
16	2	39	12	26
17	3	39	12	47
18	4	39	13	6
19	5	39	13	27
20	6	40	13	47
21	7	40	14	7
22	8	40	14	26
23	9	41	14	46
24	10	41	15	5
25	11	41	15	24
26	12	42	15	42
27	13	42	16	0
28	14	43	16	19
29	15	43	16	36
30	16	44	16	54
31	17	44	17	11
	South Declination.			

9.

At the knes of Casiopeia,
is a Starre of the second bignesse,
distant from the Pole
31. degr. 50. minutes, right
ascension 1. heure.

10.

In her lippe is a Starre of
the third bignesse, distant 31.
degr. 26.minutes, right ascen-
sion 32. minutes.

11.

The backe of her Chaire,
of the third bignesse, distant
33.degrees 2. minutes, right
ascension 23. hours 48. mi-
nutes.

12.

The great Beares thigh of
the second bignesse, distant
from the Pole 34. degrees 3.
minutes, right ascension 11.
hours 32. minutes.

Nouember hath 30. dayes.

The Prime.	H. M.	D. M.	D. M.	True Place and Declination.	
				○ in First m. yeere.	○ in m. second yere.
1. D All Sain.	8 49	1 19 14	17 36	1 18 59	17 32
2. E	8 46	2 20 15	17 52	2 20 0	17 48
3. F	8 43	3 21 16	18 8	3 21	1 18 5
4. G	8 40	4 22 16	18 24	4 22	2 18 20
5. A Poud. tr.	8 37	5 23 17	18 40	5 23	2 18 36
6. B Leonard	8 34	6 24 18	18 55	6 24	3 18 51
7. C	8 31	7 25 19	19 10	7 25	4 19 6
8. D	8 28	8 26 19	19 24	8 26	5 19 21
9. E	8 25	9 27 20	19 38	9 27	5 19 35
10. F S. Mart.	8 26	10 28 21	19 52	10 28	7 19 48
11. G	8 16	11 29 22	20 5	11 29	8 20 2
12. A	8 16	12 23	20 18	12 7	9 20 15
13. B	8 13	13 1	20 31	13	1 10 20 28
14. C	8 10	14 2	20 43	14	2 11 20 40
15. D	8 7	15 3	20 55	15	3 12 20 52
16. E	8 4	16 4	21 6	16	4 13 21 4
17. F Hugh.	8 2	17 5	21 17	17	5 14 21 15
18. G	8 0	18 6	21 28	18	6 15 21 26
19. A	7 57	19 7	21 38	19	7 16 21 36
20. B Edmund	7 54	20 8	21 48	20	8 17 21 46
21. C	7 51	21 9	21 58	21	9 18 21 55
22. D Cicily.	7 49	22 10	22 7	22	10 19 22 4
23. E Clemen.	7 47	23 11	22 15	23	11 20 22 13
24. F	7 45	24 12	22 23	24	12 22 22 21
25. G Kather.	7 43	25 13	22 31	25	13 23 22 29
26. A	7 40	26 14	22 38	26	14 24 22 36
27. B	7 38	27 15	22 45	27	15 25 22 43
28. C	7 37	28 16	22 51	28	16 26 22 50
ij. 29. D Fast.	7 36	29 17	22 57	29	17 27 22 36
20. E Andrew	7 30	30 18	23 3	30	18 23 1

South Declination.

Nouember.

of the Sunne.

	O in m third year.		O in m Leape year.	
	D.	M.	D.	M.
1	18	45	17	28
2	19	46	17	44
3	20	46	18	1
4	21	47	18	17
5	22	48	18	32
6	23	48	18	47
7	24	49	19	2
8	25	50	19	17
9	26	51	19	31
10	27	52	19	45
11	28	52	19	59
12	29	53	20	13
13	4	54	20	25
14	1	55	20	37
15	2	56	20	49
16	3	57	21	1
17	4	58	21	12
18	5	59	21	23
19	7	0	21	33
20	8	1	21	43
21	9	2	21	53
22	10	3	22	2
23	11	4	22	11
24	12	6	22	19
25	13	7	22	27
26	14	8	22	35
27	15	9	22	42
28	16	10	22	48
29	17	11	23	54
30	18	13	23	0

South Declination.

Certaine Starres neare
vnre the South Pole, with
their distance from the
said Pole, and right
Ascension.

1.
The Southermost Starre
in the South triangle, is a
Starre of the third bignesse, di-
stant from the South Pole,
11. degr. 30. minutes, right
ascension 9. hours.

2.
The Southermost of the
Croliers, is a Starre of the se-
cond bignesse, distant 22. de-
gress 30. minutes right ascen-
sion 12. minutes.

3.
In the Northwest angle of
the South triangle, is a
Starre of the second bignesse,
distant from the Pole, 27.
degress 25. minutes, right
ascension 8. hours 4. mi-
nutes.

December hath 31. dayes.

The Prime.			Leng. of the day.	True Place and Declination.						
				H. M.	D. M.	D. M.	First yeere			Second yeere
xvij. 5.	1 F			7 34	1 19 44	23 8				1 19 29 23 6
	2 G			7 33	2 20 45	23 1				2 20 30 23 11
9. viij.	3 A			7 32	3 21 46	23 6				3 21 31 23 15
xv. 4.	4 B			7 31	4 22 47	23 20				4 22 33 23 19
	5 C			7 30	5 23 48	23 23				5 23 34 23 22
	6 D			7 30	6 24 50	23 25				6 24 35 23 25
xio. iiiij.	7 E	Con. M.		7 30	7 25 51	23 28				7 25 36 23 27
xii. 7.	8 F			7 30	8 26 52	23 29				8 26 38 23 29
	9 G			7 30	9 27 54	23 30				9 27 39 23 30
2. i.	10 A			7 30	10 28 55	23 31				10 28 40 23 31
ix. 7.	11 B			7 30	11 29 56	23 31				11 2 11 42 23 31
xvii. 15.	12 C			7 30	12 57	23 31				12 57 43 23 31
vi. 9.	13 D	Lucie.		7 30	13 1	59 23 31				13 1 44 23 31
	14 E			7 31	14 3	0 23 29				14 2 45 23 30
xiii. 3.	15 F			7 32	15 4	2 23 28				15 3 47 23 28
	16 G			7 33	16 5	3 23 26				16 4 48 23 26
iiij. 11.	17 A			7 34	17 6	4 22 23				17 5 49 23 24
	18 B			7 35	18 7	6 23 20				18 6 51 23 21
xj.	19 C			7 36	19 8	7 23 17				19 7 52 23 17
xix. 8.	20 D	Fast.		7 37	20 9	8 23 13				20 8 53 23 14
	21 E	S.Thom.		7 38	21 10	10 23 8				21 9 55 23 9
8. viij.	22 F			7 39	22 11	11 23 3				22 10 56 23 4
xvij. 3.	23 G			7 40	23 12	12 22 58				23 11 57 23 59
	24 A			7 41	24 13	14 22 52				24 12 58 22 53
v. 10.	25 B	Christm.		7 42	25 14	15 22 46				25 14 0 22 47
	26 C	S.Steph.		7 43	26 15	16 22 39				26 15 2 22 40
xiiij. 3.	27 D	S.Iohn.		7 44	27 16	18 22 32				27 16 3 22 33
ii. 1.	28 E	Innocent		7 46	28 17	19 22 24				28 17 4 22 26
x. 9.	29 F			7 48	29 18	20 22 16				29 18 6 22 18
	30 G			7 49	30 19	22 22 7				30 19 7 22 9
xviii. 31	A			7 50	31 20	23 21 58				31 20 8 22 0

December.

of the Sunne.

◎ in ♀ third yeare.

D.	M.	D.	M.
1	9	14	23
2	20	15	23
3	21	16	23
4	22	18	23
5	23	19	23
6	24	20	23
7	25	22	23
8	26	23	23
9	27	24	23
10	28	26	23
11	29	27	23
12	30	28	23
13	1	30	23
14	2	31	23
15	3	32	23
16	4	34	23
17	5	35	23
18	6	36	23
19	7	38	23
20	8	39	23
21	9	40	23
22	10	42	23
23	11	43	23
24	12	44	22
25	13	46	22
26	14	47	22
27	15	48	22
28	16	50	22
29	17	51	22
30	18	52	22
31	19	53	22

◎ in ♀ Leape yeare.

D.	M.	D.	M.
1	20	0	23
2	21	2	23
3	22	3	23
4	23	4	23
5	24	6	23
6	25	7	23
7	26	8	23
8	27	9	23
9	28	11	23
10	29	12	23
11	30	13	23
12	1	15	23
13	2	16	23
14	3	17	23
15	4	19	23
16	5	20	23
17	6	21	23
18	7	23	23
19	8	24	23
20	9	25	23
21	10	27	23
22	11	28	23
23	12	29	22
24	13	31	22
25	14	32	22
26	15	33	22
27	16	34	22
28	17	36	22
29	18	37	22
30	19	38	22
31	20	40	21

4.
The forefeote of the Centaur of the second bignes, distant 29 degrees 54. minutes right ascension 14. hours, 44. minutes.

5.
Centauris thigh of the second bignes, distant 40. degrees 30. minutes right ascension 11. hours, 54. minutes.

6.
Canopus in Argo nauis, of the first bignes, distant from the South Pole, 38. degrees 10. minutes right ascension 6. hours 20. minutes.

7.
The last of Eridanus, of the first bignes, distant 50. degrees, right ascension 3. hours.

How to vse these Starres, for the time of their being vp on the Meridian, & consequently to finde the height of the Pole or Latitude by them, followes afterward.

The Sea-mans Kalender.

V		VII		IX	
D.	M.	D.	M.	D.	M.
0	0	0	11	30	20 12 30
1	0	24	11	51	20 25 19
2	0	48	12	12	20 37 28
3	1	12	12	33	20 49 27
4	1	35	12	53	21 0 26
5	2	0	13	13	21 11 25
6	2	23	13	33	21 21 24
7	3	47	13	53	21 33 23
8	3	11	14	13	21 42 22
9	3	35	14	32	12 51 21
10	3	58	14	51	21 0 20
11	4	22	15	10	22 9 19
12	4	45	15	22	22 17 18
13	4	9	15	47	22 25 17
14	5	32	16	5	22 32 16
15	5	59	16	23	22 39 15
16	5	19	16	40	22 46 14
17	6	42	19	57	22 52 13
18	7	5	17	14	22 57 12
19	7	28	17	31	22 3 11
20	7	50	17	47	23 7 10
21	8	13	18	3	23 12 9
22	8	35	18	19	23 15 8
23	8	58	18	34	23 19 7
24	9	20	18	49	23 22 6
25	9	42	19	4	23 24 5
26	10	4	19	18	23 36 4
27	10	26	19	32	23 28 3
28	10	47	19	46	23 29 2
29	11	9	19	59	23 30 1
30	11	30	20	12	23 30 0
		m	s	s	
		X	≈	Y	

This Table sheweth the Declination of the Sunne vpon every sevral degree of the Eclipticke through all the fourt Quarters of the Zodiacke: by which Table you may make tryall of the former Table of Declination, if you doubt of any part thereof, as followeth.

First, by the Kalender or Ephemerides next before, finde out the day of the Moneth, for which you desire the declination, and right against the same you shall haue the signe, degree and minute, which the Sunne possesseth in the Zodiacke the day aforesaid, with which signe and degree, enter this Table, and marke whether your Signe be at the head of the Table, or at the foote thereof, for if the signe be at the Head, then you must count the degr. thereof downward in the first Column at the left hand of the Table, but if the signe be at the foote of the Table, you must count the degrees thereof upward, in the first Colame on the right hand: and in the common angle, where the Characters of the signe and degrees thereof meetes, is the degree and minutes of Declination desired.

Example.

The 20. of Aprill 1630. the place of the Sunne is 10. degrees of Taurus, I. unde Taurus in the head of the Table, therefore counting 10. degrees thereof downe-

The Sea-mans Kalender.

downeward in the first Column on the right hand, right against i.e., in the Column where Taurus stands, is 14 degrees 51. minutes, which is the Declination of 10. degrees of Taurus, or if the Sunne, being in so many degrees of the same signe. But if the place of the Sunne haue odde minutes therewith, you must take the difference of the two nearest degrees of Declination, and worke by the proportionall parts of 60. minutes to a degree.

As for Example.

The 22. of August 1631. the true place of the Sunne is 8. degrees 27. minutes of Virgo, I finde Virgo to be in the foot of the Table, therfore in the first Column on the right hand, I count upwards 8. degrees, and right against the same in the Column where the Charakter of Virgo is, I finde 8.deg. 35. min. which is the Declination of 8. degrees of Virgo, but now there is the declination of 27. minutes to be either added or deducted, as the declination doth increase or decrease. To finde which, I take the difference betwixt 8. degr. 35. min. the declination of 8. degrees of Virgo, and 8.deg. 13. min. the declination of 9. degrees of Virgo, which is 22. minutes. Then I say, if 60. min. giue 22. minutes, what giues 27. min. Facit 10. min. nearest: which because the Declination doth decrease, I deduct 10 minutes from 8. degrees 35. min. and the remainer is 8. degr. 25. minutes, for the true Declination of 8.deg. 27. min of Virgo.

Againe, the 6. of April 1632. the true place of the Sunne is 6. degr. 38. minutes of Taurus, I finde Taurus in the head of the Table, then counting 6. degrees downeward in the first Column on the left hand, right against the same under Taurus, is 13. degr. 33. min. for the declination of 6.deg. of Taurus; then for the 38. min. I take the difference betwixt 13. degr. 33. min. and 13. 53. min. the declination of 7. deg. of Taurus: which is 20. minutes, then I say, If 60. giue 20. what giues 38. Facit 13. min. nearest which 13. min. I adde to 13. degr. 33. minutes, because the Declination doth increase and it makes 13. degr. 47. min. for the true declination of 6.deg. 38 minutes of Taurus. These three Examples (to the ingredions) arc as good as five hundred.

The

The diuision, parts, order, and explanation of the former Almanacke or Ephemerides.

The first Page of the said Ephemerides, containes an Almanacke for 24. yeeres to come, shewing the Prime, Epact, Sunday letter, Leape yeere, with all the principall moueable Feasts in the whole yeere. Next followes the Twelue moneths of the yeere in order, each Moneth containing two Faces, which two faces may be deuided into thre principall Sections: The first Common, the second and third Astronomicall: the first being indeed the common, because it is most needfull for all persons, consisteth of five Columns or spaces: The first day whereof, sheweth the space and heure of the Moones Change for 19. yeeres to come, the second sheweth the Number of the dayes in every Moneth: the third, the Letters ordinary for euery day of the weeke: the fourth, the Holy-dayes and other Dayes of note in each moneth. Where note, that those that are obserued for Holie-dayes, haue this word Fast, before them, and the fift or last of the said first section, sheweth the Length of the day in houres and minutes, where the Pole is elevated 51. degrees 40. minutes.

The second Section, contayneth fourre principall Parts, each part consisting of thre Columns, the fourre parts being fourre severall yeeres, each fourth yeere being Leape yeere, therein comprising the variety of the Sunnes course through the Zodiacke in the said fourre yeeres. And the three spaces or Columns in each yeere; the first, is the Dayes of each Moneth in the said yeere: the second, the True place of the Sunne answerable thereto: the third, the Declination or distance of the Sunne from the Equinoctiall points of Aries and Libra, toward the Tropicall points of Cancer and Capricorne, answerable to each day of the Moneth, and to the degrees and minutes of the Sunne in the Zodiacke.

The

The Seamans-Kalender.

The reason wherefore the said Table is made for four yeares and neyther more nor lesse , is; because that every yeare is not of like equalitie of Dayes one with another: For the first yeare hath 365. dayes and neere 6. houres : the second and third yeares being so likewise, but in the fourth yfare, the odde houres are united together, which being 4. times 6. is 24. houres very neere, making a naturall Day, which day is added to the said fourth yeare, wherby the said fourth yeare is called Leape yeare, because it hath one day more then the primar y or fore-going yeares.

And so this Table being made for four yeares, woulde serue for a long time, were it not that the said fourth yeare is not iust 366. dayes, but wants 20. minutes &c the $\frac{1}{3}$. of an houre, or if there were a just equality made of the dayes of the yeares, with the progresse of the Sunne through the Zodiacke, then this Table would serue for a long time without correction: but onely the Zodiacke, with the whole eight Spheares hath a certaine retrograde motion or going backward , yet so vn sensiblly , that these Tables being gathered and calculated out of the best and truest Ephemerides for the yeares 1629. 1630. 1631. 1632. according to the true place and dayly motion of the Sunne there exatly gathered, I make no question, but that they will very well serue for 20. yeares at the least , the difference of the Sunnes place e- uery 5. yeare is so small, being not much aboue 30. seconds or halfe a minute, which in 20. yeares being 5. Bessexels or Leape yeares , makes 2. minutes 30. seconds : a small matter to make any difference in the Sunnes declination.

Notwithstanding which small error that can grow in so long a time, I thinke it not amisse for the satisfying of tho'e ingenious spirits, which desire perfection, in their worke, to adde this one rule for their further satisfaction , that after these four yeares are past, for which the said former Tables are exatly and truely calculated, to know precisely the true place of the Sunne , for any other four yeares afterward, doe thus : Subtract 1620. from the date of the yeare in which you would know the true place of the Sun, the remainder whereof deuided by 4. that which remaines upon the said deuision, shewes whiche of the 4. yeares

The Sea-mans Kalender.

In the former Kalender serveth to shew the Sunnes place for. he yere proposed, and if nothing remaine after the Division, then the last of the yeres being the fourth in number, is your yere desired: which knowne, to make an equation of the Sunnes true place, marke how many Wholes are in your Quotient, so many minutes must be added to the Sunnes place in the laid yere formerly found for every day in the Moneths of May, June, July, August, September, and October, and halfe of so many minutes in the other Moneths.

As for Example.

I would know the true place of the Sunne the 15. of August, in the yere 1626. first I subtract 1620. from 1626. and there rests 6. which devided by 4. brings 1. in the Quotient, and 2. remaines, which 2. shewes that the second of the 4. yeres, answers to the yere desired, & being that there is 1. in the quotient, therefore I must adde 1. minute to the place of the Sunne which is belonging to the day and yere aforesaid, which being that to the 15. of August in the second of the yeres, belongs 1. degree 55. minutes of Virgo, I adde 1. minute thereto, and the whole 1. degree 56. minutes is the true place of the Sunne for the day and yere aforesaid, whose Declination answerable thereto, you shall find right against the same in the next Column towards the right hand, to be 10. degrees 51. minutes.

Againe, the 15. of March, in the yere 1625. I desire the true place of the Sunne, therefore subtracting 1620. from 1625. rests 5. which devided by 4. the Quotient is 1. and the remainder is 1. which remainder being 1. I must take for the Sunnes place in the first of the 4. yeres, whose place there I finde for the 15. of March to be 5. degrees 6. minutes of Aries, to which, because the quotient is 1. I adde halfe thereof, whiche being 30. makes 5. deg. 6. min. and 30. for the Sunnes true place the 15. of March 1625. whose Declination answerable thereto, you shall finde right against the same in the next Columns towards the right hand, to be 2. degrees 2. minutes Northerly.

Wherein thus much is to be noted, that albeit, that in the true place of the Sunne there may be in that time so much difference, yet

The Sea-mans Kalender.

Let in the Declination thereof there can be no sensible difference, for we see, that 3. minutes more or lesse in the true place of the Sunne, doth not produce aboue a minute difference of Declination, when the Sunnes Declination is swiftest, which is neare unto the Equinociall point, and being neare unto the Tropickes when the Declination doth increase or decrease very slowly thare of fourtne minutes difference in the Sunnes true place, doth not make any difference in the Declination at all: And therefore by that reason you may be well assured, that these Tables being exactly calculated for the yeares aforesaid, will serue you for a very long time without any sensible error.

The third section being the last of the second face, contayneth the Names, Magnitudes, and Declinations of 54. notable fixed Starres, with their right ascension in houres and minutes, most commodious to finde the elevation of the Pole, whose use followeth afterward.

Propositions to bee wrought by the Ephemerides or Sea-mans Kalender, as followeth.

To know the Moones Change.

I.

To know the day and houre of Coniunction or change of the Moone, first, looke in the first page of this Ephemerides, right against the yeare of our Lord, for the Prime number, seruing to that yere, which number keeping in memory, turne to the Moneth in which you desire the Change of the Moone, and in the first Colume of the said Moneth vnder the title Prime, looke for the Prime number which you kept in memory, which Prime numbers are there all in numerall Letters, and right against the said Prime number in the next Colume, is the number of the Day of the Moneth on which the Moone changes: and if thers be any figure

with

The Sea-mans Kalender.

with the Prime number, marke whether it be before or after the said Prime number, for if it be before, it sheweth the Moone to change so many houres before Moone: if after, it sheweth so many houres after Moone: but if thers be no Figures at all with the Prime number, then the Moone changes iust at Moone.

As for Example.

In the yeare 1628. I would know in June vpon what day and houre of the sayd Moneth the Moone changes: In the first Page being an Almanacke of 24. yeares: for the Prime, Epact, Dominicall Letter, and moueable Feasts, I finde the Prime for that yeare to be xiiij. which keeping in memory I turne to June, and in the first Colume thereof vnder the Title Prime, among the numerall Letters, I seeke for xiiij. which I find right against the 21. day of the Moone, thus xiiij. with no Figure after it, which sheweth, that in June 1628. the Moone changes the 21. day, iust at Moone.

Againe, in September the same yeare, the Prime xiiij. vnder the Title Prime in the Moneth of September, I finde the Prime aforesaid right against the 17. day of the Moneth, with the figure 2. after it, and further against it the third Colume, among the Letters for the dayes of the Week, is the Letter A. which by reason that E. is the Dominicall or Sunday Letter for that yeare, A. stands for Wednesday: So that I conclude, that in September 1628. the Moone did change the 17. day being Wednesday, 2. houres afternoone.

Of the Full and Quarters of the Moone.

2.

The next thing to be considered herein, is the first Quarter: the Full Moone, and the last Quarter thereof, which is thus done: To the time of her Change adde 7. dayes and 6. houres, sheweth the first Quarter; that doubled shewes the Opposition or Full: and thereto againe the said 7. dayes, 6. houres added, makes the time of the last Quarter.

To

The Sea-mans Kalender.

To know what Signe the Moone is in.

3.

A third thing needfull to be knowne, is in what Signe the Moone is at all times, which may thus be done: vpon the Change day next before your day required, looke in the second section of the Ephemerides vnder the yeare desired, and the Column of the place of the Sunne for the day and yeare, what Signe and degree therof the Sunne was in vpon the said day of the Coniunction, for then were the Sunne and Moone both in one Signe and degree, and to know what Signe she is in any day after, multiply her age by 12. which is the meane motion of the Moone: and from the day of the Coniunction, in the Column of the true place of the Sunne, tell forward if the number be so great, out of the Moneth to the next, till you haue told the number of the product of the Moones age, multiplied by 12. and where the said product number ends, is the signe and degree of the Moone.

Example.

The 16. of October 1629. I desire the same, in which Moneth by the first Proposition I find the Moone to change the 6. day iust at Moone, and being that 1629. is the first yeare, after the Leape yeare, in October vnder the title First yeare, I seeke the 6. day in the first Column thereof, and right against it toward the right hand is 23. degrees 9. minutes of \odot , in which signe and degree both the \odot and λ , were at their \odot , or change. then counting from the said 6 day to the 16. day is 10. dayes so; the Moones age, but so; her true place, according to your rule before directed vnto you, I count forward from the 6. day \odot . to 10. more, whiche being 10. times 12.02.1.20. the said number of 120. ends vpon the 3. of February, against which is in the next Column of the Sunnes true place 25. degrees 11. minutes of \odot . Therefore I conclude the Moone to be in 25. deg. 11. minutes of \odot the day and time proposed: otherwise, if you multiply the Moones age by 2. and divide the product by 5. the Quotient shewes the whole signe, and the remainer so many times 6. degrees as the Moone is gone from that place of the Zodiacke where she was in the Coniunction.

The

The Sea-mans Kalender.

The Moones comming to the Meridian, with the time of her rising and setting.

Multiply the Moones age by 12. and divide the Product by 15. the Quotient sheweth the houre of the Moones being South, and if any thing remaine after the division, soz every unit that remaines adde 4. minutes, because 15. degrees make an houre of time, and 4. minutes a degree. That knowne, learne by the third Proposition what signe the Moone is in, and then looke out in the second section, what time and Day of the yeare the Sunne posseseth the same Signe and Degree thereof, and right against the said Day in the last Colume of the first section, vnder the Title Length of the Day, is the length of the day, the Sunne being in the same Signe in houres and minutes : halfe that number of the dayes length taken from the time of the Moones being South, sheweth her rising, and the said halfe added to the time of her being South, sheweth her setting.

Example.

The 16. of October 1629. I find the Moone to Change the 6. day at Noone, and the number of dayes betwixt that and the 16. day is 10. for the Moones age, then multiplying 10. the Moones age by 12. her meane motion, the Product being 120. divided by 15. the degr. answering to an houre of time, the Quotient is 8. which shewes the Moone to be vpon the Meridian or at South at 8. of the Clocke that night: then by the third Proposition of former example, I find the Moone to be in 25. degrees 11. minut. of Aquarius, and the Sunne being in the same signe, degr. and min. the Diurnall arch or length of the Day being then 9. houres, 37. minutes, is the continuance of the Moone likewise, in her eyther Diurnall or Nocturnall arch, the $\frac{1}{2}$. thereof taken from her being vpon the Meridian, leaueth her rising. and likewise the other halfe adde to the time of her being vpon the Meridian, sheweth her

The Sea-mans Kalender.

her setting. Thus you see that the day and yere aforesaid, the Sunne shall haue in our Horizon rise at 4. a Clocke afternoone : she shall be South, or vpon the Meridian, at 8. a Clocke afternoone : shē shall set at 12. a Clocke at night : and her continuance aboue the Horizon, or shining to vs is 8. houres.

This is a very necessary thing to be knowne for by her being vpon any other poynct of the Compasse, you may giue a very neare guesse, at every houre of the night.

The next thing to be considered in the first section, is the Festiuall dayes, and other dayes of note, which are so common that they neede no explanation. Only this : before every Feast which is kept Holiday, is set this word Fast.

To know the length of the Day, or the length of
the Night, with the rising and setting
of the Sunne.

5.

All this is performed by the last Columnne of the first section thus : Right against the day of the Moneth desired in the last Columnne of the sayd first section, vnder the Title Length of the Day, is the length of the day desired, in houres and minutes, which number subtracted from 24. the length of the naturall day, leaues the length of the night : and halfe the sayd number taken from noon, leaues the houre of the Sunne rising : the other halfe of the day added to noon, sheweth the Sunnes setting.

Example.

The 19. of October in the yere 1631. vnder the Title Length of the Day, right against the said 19. day, is 9. hour. 36. mi. the length of the day, which 9. hou. 36. mi. taken from 24. hou. leaues 14. hou. 24. min for the length of the night : Then the halfe of 9 hour. 36. min. which is 4. hou. 48. min. taken from noon, leaues 7. hour. 12. min. for the Sun rising. The same 4. hou. 48. min added to noon : makes 16. hou. 48. min. which is 4. hour. 48. minutes after noon.

The Sea-mans Kalender.

By which you see, that the 19. of October, the length of the day is 9. hours 26. min. the length of the night 14. hours 24. minutes: the Sunne riseth 12. minutes, after 7. in the morning, and setteth 48. min. after 4. in the euening.

Thus much for the first section: the second section being four parts seruing for four sevall yeres, every part having thre Co-lumes: the first the day of the Moneth, the second the true place of the Sunne, and the third the Declination of the Sunne agreeing thereto, all the thre partes being of like quality, which are so plaine and commonly knowne, that they neede no further distinction, albeit that the uses thereof are manifold, and commodities excellent: For there are few propositions concerning the Sphære, which can be wrought without the true place of the Sunne knowne, and being so much use for it, thers are few meanes for the true knowledge thereof, but ouely by the Ephemerides, which every one cannot haue.

And for that cause I haue transferred the true place of the Sun in degrees and minutes, out of the best Ephemerides into this former Kalender, where it is ready for such as desire the same, or as haue occasion to use the same, in working conclusions, or making of Instruments Mathematicall: but most cheifly I haue here placed it, to the end that those that stand in doubt of the trueth of those Tables of the Sunnes Declination, may at their owne pleasure make tryall thereof. The order how to doe the same, is set downe in the first printed page after the said Tables: for by the true place of the Sunne, is found his Declination, either North or South: and by his Declination, and obseruation of the Sunnes Altitude vpon the Meridian, is knowne the height of the Pole or Latitude of the place where you are.

How to use the Sunnes Declination, thereby to
find out the elevation of the Pole.

6.

To finde out the Altitude or height of the Poles, in any seuerall

The Sea-mans Kalender.

all Latitude, viz. How much the Pole is rayed aboue your Horizon in degrees and minutes, It is necessary first to take by obseruation, the Meridian Altitude of the Sunne, which Meridian Altitude is knowne, by taking the height of the Sunne, that day, in which you would obserue iust at noon : at which time the Sunne is highest, being then also upon the Meridian : which found, note it downe in paper or slate: Then knowing the yeere of our Lord, with the Month in which you are, and also the day of the Month, looke in the Kalender before spoken of, for the Month and day thereof, and right against the said day of the Month toward the right hand, vnder title Declination of the Sun, you shall see the severall yeres, which the said Tables of Declination serue for. If it be the Leape yeere, looke in the last of the said fourre Tables vnder the Title Leape yeere: If it be the first yeere after the Leape yeere, then resort to the first of the said Tables vnder the title First; and so of the second and third and after those 4.yeres are past, come backe againe to the first, & proceed as you did before: then (as I said) having found out the Month, day, and yeere, direct your eye downward toward the foote of the Table, in that Table which serues to the yeere proposed, till you find a number making a right angle, with the day of your Month: or more plainly, looke what number in the last Columnne of your yeere, is right against the day of your Month: which numbers are the declination for the day desired: and being 2. numbers in the said Columnne, the first are deg. the other minutes: then regard also, whether the Sunne hath N.declination or S.declination, which is set downe betwene the severall spaces: where by the way you shall note, that from the Sunnes entrance into Aries, which is the 11. of March, till his entrance into Libra, the 13. of September, he hath N.declination: and from the said 13. of September till his entrance into Aries againe, S. declination: the said declination increasing according to the Sunnes progresse through the signes, from his entrance into Aries till his entrance into Cancer, & decreasing from Cancer, to the beginning of Libra. Then againe increasing from Libra to Capricorne, and decreasing from Capricorne to the end of Pisces, and beginning of Aries. Aries, Taurus, Gemini, Cancer, Leo, and Virgo, being signes having North declination

The Sea-mans Kalender.

nation from the Equinoctiall Circle: and Libra, Scorpio, Sagittarius, Capricornus, Aquarius, and Pisces. South signes having South declination from the Circle: then knowing (as I haue said) the Meridian Altitude of the Sun, the Declination of the Sun, and whether the Sunne hath South or North Declination, as these three things are alwayes to be considered, in knowing the height of the Pole. If the Declination be North, subtract the Declination from the Meridian Altitude, the remainder is the Elevation of the intersection or cutting of the Equinoctiall with the Meridian above the Horizon, which in common termes is the Elevation of the Equinoctiall above the Horizon: which height of the Equinoctiall, taken from 90. leaueth the height of the Pole, or the Latitude of the place of your observation. But contrarywise, if the Sunne hath South Declination, adde the says Declination to the Meridian Altitude, the Product is the height of the Equinoctiall, which likewise taken from 90. leaueth also the height of the Pole.

Example.

I obserued the 11. of July 1628. in the City of London, and found the Meridian Altitude of the Sunne to be 58. degrees, 56. minutes, and the Declination of the Sunne North 20.degrees, 28. minutes: Being that the Declination was North, I subtracted 20. deg. 28. min. the Declination of the Sunne at noone: the remainder was 38.degr. 28.minut. the height of the Equinoctiall: that taken from 90. leaues 51. degr. 32. min. for the height of the Pole, or Latitude of London.

This rule is to be vnderstod, when you are betwene the Equinoctiall and the North Pole, and the Sunne to be Southward of you. But if you shold be betwene the Equinoctiall and the South Pole, and the Sunne North from you, then you must worke contrarie: for then if the Sunne hath South Declination, you must subtract the declination from the Meridian Altitude, and if the Sunne hath North Declination, you must adde the said Declination to the Meridian Altitude,

The Sea-mans Kalender.

As for Example.

Being at Sea to the Southwards of the Line, the 4. of January 1628. suppose that you obserue the height of the Sunne at noone, and find it to be 66. deg. 20. min. then you shall find the Declination to be 21.deg.24.min. to the Southwards, which subtracted from 66.deg.20. min. the Meridian Altitude leaues 44.deg.56.min. for the height of the Equinoctiall, that taken from 90. reſts 45.deg.4. minutes, for the height of the South Pole aboue the Horizon.

Againe, suppose that being at sea, the 10. of May 1628. and obſeruing the Sunne, you take the Altitude at noone 60.deg. 30. min. and his Declination then is 20.deg.10. min. Northwards, but then not having obſerved long before, you know not whether you are to the Northwards of the Equinoctiall, or to the Southwards of the said Line: to know which, ſet the Sun by your Compasse, and marke which way the shadow of the Sun ſtreketh: for if he casteth his shadow the ſame way that the Declination is, then is the Sun betwixt the Equinoctiall and you. Your ſelfe being alſo the ſame way that the Sunnes Declination is: and therefore ſubtracting the Declination 20.deg.10. min. from 60.deg. 30. min. the Meridian Altitude: reſts 40. d. 20. min. the height of the Equinoctiall, the complement whereof 49.degrees.40. min. is the elevation of the North Pole: but if the Sunne casteth his shadow contrary to his Declination, that is to ſay: If having North declination his shadow goeth Southward, or having South declination, casteth his shadow Northward: Then either the Equinoctiall ſhall be betwixt you and the Sunne, or you in the Equinoctiall: or else you ſhall be betwixt the Equinoctiall and the Sunne: which to know, adde the Declination and the Meridian Altitude for the day proposed together: If the ſumme of the addition be leſſe then 90. degrees, ſo much as it wanteth of 90. degrees, ſhall you be diſtant from the Equinoctiall, that way which the shadow ſtreketh: If it be iuſt 90. deg. then are you under the Equinoctiall. Againe, if your ſaid Meridian Altitude and Declination added, paſſeth 90. degrees, then ſo much as is ouerplus, ſhall you be from the Equinoctiall toward the

The Sea-mans Kalender.

Sunne, and then also you shall be betwixt the Equinoctiall and the Sunne, and if you find the Sunne to be in your Zenith, so much as is the declination shall you be from the Equinoctiall, that way that the Sunne declineth: By which reason, if the Sunne bee in your Zenith, that is 90. deg. high, and hath no Declination, then are you vnder the Equinoctiall.

How to appropriate the Tables of Declination to any other Meridian.

There is in the vsing of the Sunnes Declination one principall thing to be considered: which is, that a Table of Declination made for any particular place, doth not serue generally for all places, but onely for such places as haue the like, or neare the same Longit: The reason is, because that the Declination is calculated according to the true place of the Sunne at noon, at which time the Sunne is vpon the Meridian at that place for which the saidtables are made. But you must note that the Sunne doth not come to the Meridian in all places at a like time, although that in all places the Sunne being vpon y^e Meridian makes the middle of the day. But for euer y^e 15. deg. difference of Longit. betweene any two places, the Sun comes sooner or later to the Meridian by so many houres. For if y^e place of 15. deg. to the Eastward of the place prefixed, then the Sun comes sooner to the Meridian by an houre, and if it be 15. deg. to the Westward later by an houre. And so consequently more or lesse according to the difference of the Longit. By which reason, in what part of the world soever you be, you may worke for the Declination of the Sunne in that place, by the proportionall parts of 24. houres Declination, to the houre of difference in Longitude.

As for Example.

Being in Brasilia (a part of the West Indies) the 10. of Aprill this yere 1628. whose Meridian is distant from the Meridian of England to the Westward, about 45. deg. which is 3. houres of time that y^e Sunne should come to y^e Meridian later there then here at London where the Table is made: For when it is 12. a clocke here, it is but 9. there, and being noon there, it is 3. a clocke here.

Therefore

The Sea-mans Kalender.

Therefore to apply this Table to that place, I finde the Declination for the day aforesaid, vnder our Meridian to be 11. degr. 43. min. at noone, and by reason that when it is 12. a clocke at Brasilia, it is then at London 3. houres past. Therefore by the rule of proportion, I take what declination the sun hath at 3. a clocke afternoon as followeth. I take the difference of declination betwene the day aforesaid, and the next following, which is 20. min. then I say by the rule of 3. if 24. houres giue 20. min. what giues 3. houres, the time of the difference of Longit. Facit 2. min. and 30. seconds, which (because the declination increases) I adde to the number of the day proposed: so I conclude the declination of the Sunne to be the 10. of Aprill at noone, in the Kingdome of Brasilia, 11. degrees, 45. minutes and $\frac{1}{3}$.

Againe the day and time aforesaid, in the Bay of St. Sebastian, whose Longit. is 58. degrees to y Eastward of London, answering nare to 4. houres of times, shewing that the Sunne comes sooner to the Meridian in the Bay of St. Sebastian, by 4. houres then at London, by which reason the declin. is lesse there, then at London because the declination doth increase: For if y declinatio did decrease, it would be more there then at London: and to know the declination of the Sunne in the Bay aforesaid: I take the difference betwixt the declination of the 10. of Aprill, & the declination of the day next before, being 20. min. Then (I say) if 24. houres giues 20. min. what 4. houres Facit 2. min. which deducted from 11. deg. 43. min. the declination of the Sunne the 10. of Aprill aforesaid at London, leaueth 11 deg. 40. min. The declination of the Sunne at noone: in the Bay of Saint Sebastian, being that when it is 12. of the clock there, it is but 8. a clocke at London: or in any place having the same Longitude.

How to obserue the height of the Pole by the Starres.

THE working hereof by the Starres, to find the height of the Pole, is all alike with the working thereof by the Sunne: for if you obserue any Starre upon the Meridian, looke in the third

The Sea-mans Kalender.

or last section of the Ephemerides, amongst the Moneths so^r the name of the Starre whiche you obserued, wherewith you shall find his Declination either N. or S. and the right ascension thereof in houres and min. and hauing taken the Altitude of any Starre vpon the Meridian, you haue nothing to marke in the Table so^r this but the Declination, which if it be North, take the Declination of the Starre from the height thereof: The remainder taken from 90. leaueth the height of the Pole: but if the Starre haue South Declination, adde the Declination to the Altitude taken, and the Produc^t thereof taken from 9. leaues the height of the Pole: Also to find the time of any Starres comming to the Meridian, is set downe after the Tables of the Sunnes right ascencion.

Example.

The 25. of November 1628. I obserued a Starre of the second bignes in the shoulder of Pegasus, or the Flying-horse, about 8. of y clocke in the Evening, and found the Meridian Altitude thereof to be 51. deg. 26. min. and in the Kalender, in the second Face therof I find the said Starre to haue 12.deg. 38 min. North Declination which taken from 51.deg. 26. min. the height obserued leaues 38. deg. 28. min. the height of the Equinoctiall: the complement whereof 51.deg. 32. min. is the height of the North Pole at London.

And so consequently so^r all those Starres whose Declination is taken from the Equinoctiall: but so^r those Starres which are any thing nere to the Pole, whose distance or Declination is counted from the Pole, their working is thus: You must note, that being any thing farre to the Northward, some of those Starres will be twice vpon the Meridian, viz. once above the Pole, and once vnder the Pole: Therefoze if you obserue any Starre vpon the Meridian vnder the Pole, adde the distance of the said Starre from the Pole to your Altitude obserued, the totall is the height of the Pole: But if you obserue any Starre vpon the Meridian aboue the Pole, so much as is the distance or Declination of the said Starre from the Pole, you must take from the Altitude taken, the remainer is the height of the Pole.

As.

The Sea-mans Kalender.

As for Example.

If at London you obserue the former Guard-Starre beneath the Pole vpon the Meridian, you shall find it to be 37. degrees 21. minutes, to which if you adde 14. degrees 11. minutes., the distance of the said Starre from the Pole, the totall is 51. degrees 32. minutes, the height of the North Pole at London. Againe the same Starre obserued vpon the Meridian aboue the Pole is 65. degrees 43. minutes, from which 14. degrees 11. minutes the distance aforesaid taken, leaueth 51. degrees 32. minutes, as before.

Note that being farre Northward, those Starres betwene the Equinoctiall and the Tropike of Cancer, are best to obserue, and being betwene the said Tropike and the Equinoctiall, those Starres aboue the Pole are fittest for obseruation, and for those that trauaile farre beyond the Line to the Southwards : the like order must be kept by the Starres, betwene the Equinoctiall and the Tropick of Capricornus, and those that are neare the South Pole.

And whereas the North Starre it selfe being very neare unto the Pole, is the fittest Starre for to bee obserued by reason of the neareresse thereto, I haue for your further ease, made an exact Table for the Declination of the North Star, from the Diameter of the Poles Circle, described by the North Starre; which may bee also, or rather called the Elevation or depression vpon euery point of the Compasse, being very commodious, by reason whereas the other Starres are onely to be obserued vpon the Meridian. This said North Starre by the helpe of this Table following, may bee obserued at any time of the night. whose use followeth after the said Table.

This

The Sea-mans Kalender.

Points of the Com- pasle.		Degrees	Minutes	Of Decli- nation
N.W.b.W.		0	0	
Northwest.		0	34	
M.W. by N.		1	6	
N.N.W.		1	36	
N. by W.		2	4	
North.		2	24	
N. by E.		2	40	
If the guards be	N.N.E.	2	50	Under
	N.E. by N.	2	52	the
	Northeast.	Load	50	Pole.
	N.E by E.	star is	40	
	E. N. E.		24	
	E. by N.		4	
	East.		37	
	E. by S.		6	
	E. S. E.	0	34	
	S.E. by E.	0	0	
	Southeast.	0	34	
	S.E. by S.	1	6	
	S.S.E.	1	36	
	S. by E.	2	4	
	South.	2	24	
If the guards be	S. by W.	2	40	Above
	S.S.W.	2	56	the
	S. W. by S.	Load	52	Pole.
	Southwest.	star is	50	
	S.W. by W.		40	
	W.S.W.		24	
	W. by S.		4	
	West.		36	
	W. by N.		6	
	W.N.W.	0	34	

This former Table sheweth how much the North Star is, eyther aboue or beneath the Pole, the Guards being vpon any point of the Compasse.

The use of which Table is thus: having obserued the Altitude of the North Starre, marke so neare as you may, vpon what point of the Compasse the Guards then are: which knowne, referte to this Table, and finding there in the said point vpon which the Guards were at your obseruation, right against the same is the number of degrees and minutes, which the Starre is either aboue or beneath the Pole, which number so found, if it bee aboue the Pole, must be subtracted from your Altitude taken, and if vnder the Pole, it must be added to the said Altitude taken: which total added, or remaynes subtracted, is the true height of the Pole it selfe.

As

The Sea-mans Kalender.

As for Example.

Obseruing the North Starre to be 58. deg. 30. min. when the Guards are at the Northeast, I looke in the Table for the North-east point of the Compasse, & right against the same I find 2. deg. 50. min. vnder the Pole, which being that the North Starre is vnder the Pole, I adde his declination 2. deg. 30. min. to 50. deg. 30. min. his Altitude obserued, and the totall 51. deg. 20. minutes, is the iust height of the Pole it selfe in that place.

Againe, obseruing the North Starre to bee 50. degrées 15. min. aboue the Horizon, when the Guards are vpon the Southeast point of the Compasse, I looke for southeast in the Table, and right against the same is 34. minutes aboue the Pole, which being that the Starre is then so much higher then the Pole it selfe, I subtract 34. minutes, the Declination of the Starre from 50.deg.15.min. the Altitude taken and the remainer 49.degrées, 41 minutes, is the perfitt height of the Pole aboue the Horizon in the said place of obseruation.

And now having made plaine vnto you the vse and profit of the said Table, it being indeed so necessary and commodious for the Mariners vse, as any rule whatsoeuer, it resteth now to speake somewhat more particularly of the other fixed Starres, set downe in the former Kalender or Ephemerides, whose vse is manifold and very excellent, but their vse for the finding of the Poles elevation by their declination, obserued at there being vpon the Meridian being formerly shewed, it is onely requisite to explayne vnto you a briefe and easie methode for the exact and ready finding of the true tyme of any of the fixed Starres comming to the Meridian, at which time they are onely fit for to be obserued: for the knowledge whereof, I haue here placed a Table of the right ascension of the Sunne for every day of each Moneth throughout the whole yéare, according to his true place for every of the said dayes formerly set downe in the Kalender or Ephemerides: the vse whereof followeth after the said Table.

A Table

A Table of the Sunnes.

Dayes.	Ianua.		Febru.		March.		Apriill.		May.		June.	
	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
1	19	30	21	39	23	25	1	16	3	11	5	15
2	34		43		28		20		15		19	
3	39		47		32		25		19		23	
4	43		50		36		29		23		27	
5	47		54		40		33		27		31	
6	52		58		44		36		30		36	
7	56		62		47		40		34		40	
8	20	0	22	6	51		43		38		45	
9	4		9		55		47		42		49	
10	8		14		58		51		46		53	
11	13		18	0	2		55		50		57	
12	17		21		6		58		54	6	1	
13	22		25		9	2	2		58		5	
14	26		29		12		6	4	2		9	
15	30		32		16		10		7		13	
16	34		36		20		14		11		18	
17	38		40		23		18		15		22	
18	42		44		27		22		19		26	
19	46		48		31		26		23		30	
20	50		52		35		30		27		34	
21	54		56		38		33		31		38	
22	58		59		42		37		35		42	
23	21	3	23	3	46		41		39		46	
24	7		7		49		44		43		51	
25	11		10		53		48		47		55	
26	15		14		57	3	52		51		59	
27	19		18	1	0		56		56	7	3	
28	23		23		3		0	5	0		7	
29	27				7		4		3		11	
30	31				11		7		4		15	
31	35				15		11		11			

right ascension in Hours and Minutes.

Days. es.	July.		August		Septem		O. Stob.	Nouem	Decéb.	
	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
1	7	19	9	22	11	16	13	5	15	5
2		23		26		20		8		9
3		27		36		23		12		13
4		31		33		27		16		17
5		35		36		30		19		17
6		40		40		33		23		25
7		44		44		37		27		30
8		48		48		41		31		34
9		52		52		44		34		39
10		56		56		48		38		43
11	8	0		59		52		42		47
12		4	10	3		55		42		52
13		8		7		59		45		56
14		12		11	12	3		49		0
15		16		15		7		53		5
16		20		18		11	14	57	16	10
17		04		22		14		5		14
18		28		26		18		9		18
19		31		29		22		13		23
20		35		33		25		17		27
21		39		36		29		20		32
22		43		40		30		24		36
23		47		44		36		28		41
24		51		47		40		32		45
25		55		51		43		36		50
26		59		54		47		40		55
27	9	3		59		51		44		59
28		7	11	2		54		48		59
29		11		6		58		53	17	16
30		15		9	13	2		57	3	21
31		19		13		15	1		8	25



A Declaration of the former Table.

Inke it not amisse, before I shew the vse of the former Table of right ascension, for the finding of the time of any starres comming to the Meridian, to explayne unto you what we call right ascension. Know therefore, that in the Sphære there is right ascension, Oblique ascension, and meane ascension, which haue all severall definitions: but the rest being impertinent, I will onely speake of right ascension which is thus defined: Right ascension is that portion of the Equinoctiall whch commeth to the Meridian, of þone Stead with any starre, or any part of the Eclipticke, or more plainly, it is that number of degrees of the Equinoctiall, comprised betwixt the Vernal Equinoctiall point, or intersection of the said Equinoctiall Circle, and the first minute of Aries, and that starre or part of the Eclipticke, which is upon the Meridian at the day or time desired. As for your better understandyng, if the beginning of Aries be upon the Meridian, or any point or starre in the said beginning of Aries, then hath the said point or starre so situated, no right ascension at all, by reason that the beginning of the Equinoctiall commeth to the Meridian therewith: But if the beginning of Cancer, or any starre in that situation be upon the Meridian, then is there with it under the same Meridian 90. degrees of the Equinoctiall, or sixe houres of time, being that every 15. degrees of the Equinoctiall answers to one houre of time, shewing that that starre or point, which is in the beginning of Aries, shall come to the Meridian 6. houres sooner then that other whch is in the beginning of Cancer, and so of others: I doubt not but

The Sea-mans Kalender.

but that these few words will suffice to give you the better light to that which followes. First therefore, to find the right ascension of the Sunne at any time, looke for the Moneth in the head of the Table, & for the day of the Month at the left side of that face, where the Month desired is, and in the common Angle answering to them both : is the houre and minute of the Sunnes right ascension.

As for Example.

I desire the right ascencion of the Sun, the 25. of May : first in the head of the Table I looke for May, which found in the first Columnne on the left hand, I looke for 25. Right against the same in the common Angle, vnder the title May, I find 4. houres and 47. min. for the right ascencion of the Sunne the said 25. of May.

These things thus knowne and considered, it is to be noted, that whereas the Sunne hath a different number for his right ascencion everyday, and the Starres keepe every one still alike number for his peculiar right ascencion, the reason thereof is this.

The Starres are all fixed in the eight Spheare, in which eight Spheare is also the Zodiacke placed, not onely to limit the course and progresse of the Sunne in his continuall motion, but also to give a certaine limitation to the Starres, who being fixed in any part of the Heauens, that certaine Meridian or Circle of South and North, which passeth through the Center of any Starre cutteth also in one place or other of the said Zodiacke : which number of degrees so put in the Zodiacke, is the Longitude or distance of the said Starre from the beginning of Aries : Now the Star (as I said) being so fixed hath no motion, but onely as the whole frame of the Zodiacke with the right Spheare, and all the Circles and Starres therein placed, which as is apparent to the sight, is by the first mouer carried round about from East to West in 24. houres : but the Naturall motion of the said eight Spheare, being from the West to the East, is so slowe, that it is vnensible, whereas the Sunne being of a very swift motion, in comparison of the former, his motion being every 24. houres, neere upon a

deg.

The Sea-mans Kalender.

degree little moze or lesse, makes his motion from the W. to the E. in the Zodiack most apparant in his motion , also describing the Zodiacke Circle, as never declining from the middle thereof: And further , the Sunne being the ruler of the Day , and director of the Night, is the sole and onely distinguisher of Time : For this is apparent to the view of every one, that the Sun being vpon the Meridian, aboue the Horizon, makes the middle of the Day, and being vpon the Meridian vnder the Horizon, makes also the middle of the Night : which being (as I haue said) that the Sun comes alwaies to the Meridian iust at 12. a Clocke , it followes necessarily, that what Starre or point in the Zodiacke soever, hath greater Longit. then the Sun, his right ascension is also greater then the Sunnes: and looke how much the said right ascension is moze then the Sun, by so much later then the Sunne must the said Starre or point come to the sayd Meridian. Proportionally after 15. degr. to an hour, and 1. degree to 4. minutes of time.

Take this therefore for a generall rule. that if the right ascension of the Starre, whose time of comming to the Meridian you desire to know, be greater then the right ascension of the Sunne, subtract the Sunnes right ascension from the sayd Starres right ascension, and the remainer (if it be lesse then 12.) is the houre & minute that the Starre comes to the Meridian afternoone : and if the remainer be moze then 12. subtract 12. also, and the remainer shewes so many houres and minutes after midnight : But if the Sunnes right ascension be greater then the Starres right ascension, then adde 24. houres to the Starres right ascension, and subtract the Sunnes right ascension therefrom, as before, the remainer shewes the Starres comming to the Meridian afternoone : If it be lesse then 12. or if it be moze then 12. 12. also subtract, the remainer shewes so many houres and minutes after midnight.

As for Example.

The 15. of November, I desire to know at what time Oculus Tauri (or the Wals eye) will be vpon the Meridian: first in the former Table of the Sunnes right ascension, I looke for the 15. of November

The Sea-mans Kalender.

November, where I finde the Sunnes right ascension for that day to be 16. houres and 3. minut. and in the Kalender or Ephemerides among the fixed Starres, I finde the right ascension of the Bulls eye to be 4. houres 13. min. which being less than the Sunnes right ascension, I adde 24 houres to 4. houres, 13. min. and from the totall 28. houres 13. min. subtracting 16. houres 3. minutes the Sunnes right ascension, rests 12. houres, 10. minutes, which being more then 12. houres, I take away also 12. houres, and so there rests 10. min. after midnight, that Oculus Tauri comes to the Meridian the said 15. of November.

Againe, the 10. of Aprill, I would know at what time the Lyons tayle will be vpon the Meridian: In this Table I finde the Sunnes right ascension, the day aforesaid, to be one houre 51. min. and in the Kalender I finde the right ascension of the Lyons tayle to be 11. houres 29. minutes. Then subtracting one houre 51. minutes, the Sunnes right ascension, from 11. houres 29. minutes, the Starres right ascension, rests 9. houres 28. minutes, shewing that 38. minut. after 9. a clocke at night, the said Starre shall be vpon the Meridian.

The Monethly time of each Starres being in rule for obseruation.

January.

Oculus Tauri, the whole constellation of Oryon, Hyrcus, the Goat, the great Dog, the little Dog, the greatest part of Leo, the Crosiers, Canopus and the South Triangle.

February.

The whole Constellation of Leo, Arcturus, the Centaure, and the Virgins Spike.

March.

The hidden part of Leo, Hydra, Virgins Spike, the Centaure, Arcturus, the Balance, and Scorpio.

Aprrill.

The Centaure, Balance, Scorpio, Lyra, and Sagittarius.

G

May

The Sea-mans Kalender.

May.

Scorpio, Lyra, South Crowne, and Eagles heart.

June.

South Crowne, Eagles heart, Swans tayle, and the Dolphin.

July.

The Dolphin, Fons ahand, and Pegasus shoulder.

August.

Fons ahand, Pegasus, Cassiopeia, Andromeda, the Whale, and the Ram.

September.

Cassiopeia, Andromeda, the Whale, the Ramme, Medusa, Perseus, and Eridanus.

October.

All the former of September, and October Oculus Tauri, Oryon, Hyrcus, and the great Dog, the Crostiers, and Canopus.

Nouember.

All the former of October, with Nouember, the little Dog, and the South tryangle.

December.

The Whale, the Ramme, Medusa, Perseus, Eridanus, Oculus Tauri, Hyrcus, Oryon, Canopus, great Dog, little Dog, Hydra, and Leo, in the Moneths aforesaid, at one time or other of the night, these Starres are vpon the Meridian.

Hauing sufficiently explained vnto you, the manner and way how both by the Sunne and Starres to attaine to the true heighth of the Pole or Latitude of any place : I purpose now (God willing) to speake somewhat of the Longitude : which as the former is most easie, and the finding thereof knowne almost to all Seamen, so is the other as vncertaine, and hath not yet hitherto beene found out or knowne exactly to any, albeit, that many Learned men and of great experiance haue laboured very earnestly for the same, and many good meanes haue they invented, as helpest and assistance vnto Mariners in their long nauigations and Travels, by which through with great labour, care and industry, they transport themselves to the most Regions of the world : with scarce in the ease and facility they might doe it, if they could as perfectly

The Sea-mans Kalender.

perfectly and readily finde the Longitude at all times, as there may the Latitude: for then having sayled many dayes in thy knowne pathes vpon the large and spacious Seas, and enduring all those vndurable troubles, miseries, and unspeakeable calamities, which doe for the most part attend vpon Long-voyages: yet after all this, if vpon the first faire opportunitie, they could readily with the Latitude, finde also the Longitude, their forepassed troubles would bee ioysfully remedied, being that these two (like louing sisters) would apply such pleasing comfort to their cold stomaches, after their tedious trauels, by giuing them the true pricke or place of their then present being. Peter Appian, and Gemma Frisius, haue written thereof, as also some others: but truely in my opinion, it was neuer brought to such exquisite perfection, as it is now a dayes: and for mee to write thereof, were but as it were to set vp a Candle at None dayes, rather to shew mine owne scly, then to lighten those that know a better way then my selfe: in which doing, well may Appelles saying, Nec sutor ultra crepidam, be applyed vnto me, but for my excuse I doe intreat the Judicious to perswade themselves, that it is faire from my thought to set downe any thing in this for a president vnto them, but onely in good will to shew my opinion thereof, to the Ignorant, being as followeth.

First, therefore the Latitude being knowne: by finding the Longitude also, you haue the true pricke or place in the Globe, or Carte, where your Ship is, which to finde nearest, is two waies, one by dead Reckoning, the other by Obseruation: But dead Reckoning (as they call it) being as I take it in. A v^erd, I will speake first thereof, by which if it were possible that this Reckoning could exactly and precisely be kept, it would give both Latitude and Longitude without any obseruation at all: The different Latitude being onely the distance that the Ship is departed from the Paralell where she last was eyther Norward or Southward: and Longitude being the distance that shee is departed from the Meridian, eyther Eastward or Westward: for the knowledge whereof, the e things are principally to be considered.

The Sea-mans Kalender.

First, the true prick or place of the Ships being at the beginning of the voyage.

Secondly, a sound and experiment iudgement of the way that the ship maketh, with every swift wind

Thirdly, to know exactly how much the Compasse doth bary from the trus North or South point, vpon which the Neede is caught eyther Eastward or Westward, in as many severall places as conueniently may be observed.

Fourthly, to note diligently the Flods or Currents, which may cause the Ships way to be more Loeward, or otherwise then expectation, and to give allowance of her course and way accordingly.

Fiftly, the severall points of the Compasse that shē makes her coarieg vpon, and what way she hath made vpon every point.

Sixtly, to bring those severall courses into one straight line, thereby to know what course shē hath made good, with the nearest distance vpon the said point or Rombe, that she hath made her way good vpon.

And lastly, knowing how many leagues doth raise or lay a degrē vpon the sayd Rombe, the true reckoning of your said course and distance, gives you the difference of Latitude or Paralell where the Ship then is: and al o knowing how many leagues answer to a degrē of East and West in the sayd Paralell, the course, distance and Latitude gives the difference of Longitude or the Meridian, vnder which the Ship then is, the intersection of which said Paralell and Meridian, is the pricke or place of the Ships then being, of which things I will speake more particularly after ward.

Now it resteth to speake something of knowing the Longitude onely by obseruation, which is very necessary to bee knowne, that thereby the one may make tryall of the other, being that if the account by dead reckoning, and also by obseruation doe both agree in the Latitude and Longitude, then may you be well assured, that you know truly the place where you then are, which Longitude by obseruation is thus knowne: prepare a very perfect and true running glasse, which may precisely runne 24. houres without errore, and about the time that you purpose to set sayle, set the sayd glasse.

The Sea-mans Kalender.

of the Compasse, from the true North or South : but if the Sunne be eyther to the Northward or Southward of the Equinoctiall, having amplitude: then is there a respect also to be had to the Sunnes amplitude : as thus, if the Sunne haue North or South amplitude, and that you obserue the Sunne to rise or set so much from the E. or W. point of the Compasse as is the Sunnes amplitude, and likewise the same way that the amplitude is, then hath the Compasse no variation : but if the sunne hauing north amplitude, riseth notwithstanding more Northerly by your Compasse, then by the said amplitude it shold doe, the degrees of true amplitude, deducted from the amplitude which the Compasse sheweth, leaving the variation of the Compasse to be Eastward of the North : but if the true amplitude be greater, then the Compasse sheweth, the one deducted from the other, leaueth the variation to the Westward of the North and if the amplitude be southerly, and the Compasse shew the Sun to rise northerly, both the differences added together gives the variation easterly : or if the Amplitude be Northerly, and the Compasse shewes it to be Southerly, then both the differences added together, gives the variation Westerly. All this is to be understood, when you obserue by the Amplitude Ortia, viz. at the Sunnes rising: for if you obserue the setting thereof, then by adding or deducting the differences betwixt the true amplitude knowne, and the Amplitude giuen by the Compasse, the totall or remaine shewes the Compasse to vary so much to the contrary side : an example will make all this plaine unto you, which let it be thus proposed. Suppose that being at Sea, you find by the Table of sines hereafter set downe (or by some other meanes) the Sunnes Amplitude at that time to be 20. degræs to the Northward, and setting the Sunne at his rising by the Compasse (as is before shewed) you find that the Sunne riseth 35. deg. to the Northward of the East, which is somewhat to the Northward of the northeast and by E. point, therefore subtracting 20. deg. the Sunnes true Amplitude, from 35. deg. the Amplitude which the Compasse sheweth the remainder being 15. deg. sheweth the Compasse to be so much varied from the North to the Eastward, which is 1. whole point, and about 1. third, otherwise the Sunne hausing the same Amplitude Northerly, (as is afore-

The Sea-mans Kalender,

said) and setting him at his going downe by the Compasse, the sayd Compasse sheweth him to set onely 5.deg. to the Northward of the West, which deducted from 20.deg. the true Amplitude leaueth 15.deg. for the variation of the Compasse to the Eastward, as before.

As for Example.

Suppose that the Sunne hauing 23. deg. of South Amplitude, and the Compasse sheweth his Amplitude or rising to be 11. degrees Northerly adde 23. degrees the true Amplitude with 11. degrees of contrary Amplitude, which the Compasse sheweth, and the product 34. degrees, being 3. whole points and somewhat more, sheweth that the compasse is so much varied from the true North to the Eastward.

Againe, the Sunne hauing the same Amplitude Southerly, you obserue at his setting, and fiade by your Compasse that hee setteth 11.deg. Northerly, adding the 2. Amplitudes as aforesaid, 23. and 11. the product 34. sheweth the variation so much to the Westward, being that in the obseruation at his rising, the East and by North points of the Compasse standeth where the EastSouthwest should be: and at his setting in the other obseruation, the West and by S. points of the Compasse, pointeth to the Sunne, in which place should be the WestSouthwest points.

The few words will suffice, being (that albeit to the ignorant they seem somewhat darke) yet in the practise therof, they shall find it I do vt not, but very plaine and easie for their understanding, otherwise there are sundry sorts of Instruments to finde the variation by, but others hauing already written thereof, I haue thought god also to shew my opinion of this plaine and easie way, knowing that the Mariner hauing made exerience of many wayes, will onely v^et that which he findeth best, both for his ease, profit, and truth thereof. And note, that whatsoever is here spoken concerning the finding of the variation by the Amplitude, the very like may be also obserued by the Azimuth which by the Sunne or starres, being to be seene, may at anytime be knowne.

How

The Sea-mans Kalender.

glasse a running iust at 12. a clock, when the Sunne is vpon the Meridian: being run cut bee sure to turne the said glasse instantly as it is out, not losing any time in the turning of it, and so having very warily kept the said glasse till you thinke good to make a nob, seruation, at which time it is requisite to haue in readinesse a halfe houre glasse, and a minute glasse, that if the 24. houre glasse be out before the Sunne come to the Meridian, then so soone as it is out, to turne the halfe houre glasse o2 mi. glasse as you see occasion thereby to know presently how much the 24. houre glasse is cut before the Sunne comes to the Meridian; for if the Sunne is vpon the Meridian iust when the 24. houre glasse is out, then you may assure your selfe that you haue sayled North o2 S. and are still vnder the same Meridian that you were at the first: but if the 24. houre glasse be out before the Sunne come to the Meridian, for every 4. min. that the glasse is out before none, your difference of Longit. is 1. deg. to the Westward, and for every houre 15. deg. And contrary, if the Sun come to the Meridian before the glasse is out, then according to the same proportion of time, is your difference of Long. to the eastward, which difference of Longit. if you multiply by the number of miles answerable to a deg. of Longit. in that Latit. where you then finde your selfe to be, the product gives the miles of distance, that you are eyther to be Eastward o2 Westward of the Meridian, that you departed from.

The like may also be effected by any of those fixed Starres, whose true time of comming to the Meridian you know: For if the accompt of time precisely kept by your glasse, and the Stars comming to the Meridian as you finde in your table of right ascension doe iustly agree, then are you still vnder one and the same Meridian, but if the time be past by your accompt, that the said Starre should be vpon the Meridian before the Starre doth come to the Meridian, for every houre that the Starre comes to the Meridian after the said time past, your difference of Longit. is 15. deg. to the Westward, and for every houre that the Starre comes to the Meridian before by your accompt, of time truely kept, it should be vpon the Meridian, your difference of Longitude is 15. deg. to the Eastward. Thus much shall suffice to be spoken concerning my opinion for finding

The Sea-mans Kalender.

the Longitude at Sea by obseruation, and now resteth to speake somewhat of some necessary helpe, for the finding thereof by dead reckoning, as is before promised.

Of the variation of the Compasse.

Concerning the Variation of the Compasse, it hath beeue very learnedly treated of by divers of our owne Country-men, and in our vulgar tongue, and namely by Master Norman, and M. Burrowes, in their Booke called the New Attractiue, and Variation of the Compasse: And since that, most excellently and ingeniously written of by that rare and learned Mathematician of our time, P. Wright, in his booke of the Correction of Ecrors in Nauigation: as also in his Translation called the Hauen finding Art: In which respect it is needlesse for me here to write any thing thereof: onely let it suffice to speake a little thereof, and being necessary to the knowledge of the foregoing matter, for them that would willingly note how much the Compasse doth vary in several places of their sailing: I thinke it best to haue the Pædles of their compasses touchid upon a good stone, and so placed directly vnder the North point of the fly, without allowing any variation at all, the outer edge of the said fly to be graduated each quarter into 90. deg. for the ready reckoning of the deg. that the Compasse doth vary from the true North or S. eyther toward the East or West: ouer which fly, it is necessary to haue a round Circle of Brasse, with 2. sights vpon the same the one directly against the other at opposite points to be raised perpendicularly where occasion shall serue: which circle, with the sights thereon, as I haue said, being placed vpon the glasse ouer the fly, within the box where the Compasse is: when you would obserue the Variation of the Compasse iust eyther at the Sunne arising or setting, turne the sights in the Brasse circle towards the sunne, and looking through the same, marke precisely how many degrees the Sunne riseth or setteth from the East or West point of the fly or Compasse: For if the Sun be in the Equinoctiall having then no amplitude so much as is the difference of the Sunnes rising or setting from the E. or W. points shewed by the Compasse, is the variation

The Sea-mans Kalender.

Example.

London and Middleborough haue both in a manner one Latit. viz. about 52. degr. and I find in this Table, that in the Paralell of 52. degrees 37. miles make a degrē of Longitude, the Longitude of London is 25. degrees 50. minutes, which subtracted one from another, leaues 3. degrees 50. minutes for the difference of Longitude. Then multiplying 3. degrēs by 37. miles, the Product is 111. miles: Then for 50. minut. I say by the rule of 3. if 60. minut. gives 37. miles, what gives 50. minutes: Facit nære 31. which added to 111. makes 142. miles, v247, leagues and a mile for the distance betwixt London and Middleborough.

Deg. of Latit.	Deg. of Latit.	Min. to a Deg.	Min. to a Deg.
10	60	30	30
10	59	29	29
15	58	28	28
18	57	27	27
21	56	26	26
24	55	25	25
26	54	24	24
28	53	23	23
30	52	22	22
32	51	21	21
34	50	20	20
35	49	19	19
37	48	18	18
38	47	17	17
40	46	16	16
41	45	15	15
42	44	14	14
44	43	13	13
46	42	12	12
47	41	11	11
48	40	10	10
49	39	9	9
51	38	8	8
52	37	7	7
53	36	6	6
54	35	5	5
55	34	4	4
57	33	3	3
58	32	2	2
59	31	1	1

But if the two places differ both in Longitude and Latitude, then is the working moe difficult then eyther of the former: For first you must take the difference of the two places in Longit. and then their difference also in Latit. and multiplying the degr. of their difference in Latit. by 60. set the Product thereof by it selfe, for the first number: then multiply the difference of Longit. by the number of miles answerable to each Latit. severally, and adde both the Products together: the halfe whereof set downe for your second number, and multiplying each of the said two numbers into it selfe squarely, adde both the products together, and extracting the square roote thereof, the said square roote, is the distance betwixt the two places desired.

As for Example.

To goe directly in a right Line from Callice in France, to Constantinople in Grecia: I find by the Tables following, that the Longit. of Callice is 29. deg. 10. min. and the Latit. thereof 50. deg. 40. minut. Also the Longitude of Constantinople is 61. deg. 20. min. and the Latit. 44. deg. 40. min, then subtracting the

The Sea-mans Kalender.

the lesser Longitude from the Constantine. 61. degr. 20. min. Long.
S.
greater, the difference of Len- Callice, 29. degrees 10. minut. Long.
N.
gitude is 32. deg. 10. min. Difference, 32. degr. 40. min.
Also I take the one Latitude Callice, 50. degrees 40. minut. Lat.
N.
from the other, and there rests Constantine. 44. deg. 40. minu. Lat.
S.
6. deg. for the difference there. Difference, 6. degr. 0. minut. Lat.
S.
of, which 6. degrees multiplied by 60. miles, produceth 360. miles
for the distance betwixt the Paralell of Callice, and the Paralell
of Constantinople. Now for the distance betwixt Callice, and the
Meridian of Constantinople, I multiply 32. degrees 10. minutes,
the difference of Longitude by 60. miles answerable to a de-
gree in the Paralell of Callice, and the Product is 1222. miles:
When multiply 32. degrees 10. minutes, the aforesayd difference
of Longitude by 42. miles answering to a degree in the Paralell of
Constantinople, which Product being 1351. miles, is the distance
betweene Constantinople, and the Meridian of Callice: Those
two distances added together make 2573. the halfe
whereof, being 1286. is the meane distalce be- 1 2 2 2
twixt the Meridians of the said two places: So 1 3 5 1
haue you two numbers, viz. 360. miles, the di- 2 5 7 3
stance that the Paralell of Constantinople is to the 1 2 8 6
Southwards of Callice, and 1286. miles the di-
stance that Constantinople is to the Eastward of the Paralell of
Callice: Therefore if you multiply 360. into it selfe, the Pro-
duct is 129600. And likewise multiplying 1286. into it selfe, the

The manner
how to extract
the square and
Cube roote of
any number is
more plainly
taught, toward
the end of the
Booke.

product is 1653796. which both added together,
make 1783396. the square root of which number
is the distance desired: Which to helpe those that
are not perfect in extraction of rootes, I haue here
set downe the working thereof as followeth.—

First, I set downe the proposed number with
a Quotient, and vnder the last figure, I put a
pricke: and so likewise vnder each other figure
toward the left hand, leaving betwixt each pricke one figure un-
pricke: So haue I vnder this number, 4. prickes, signifying that
the roote must consist of four figures, and so finde them out.

1653796
129600
—
1783396

1783396
1

3

The Sea-mans Kalender.

How many Leagues sayling vpon any

Point of the Compasse, will raise or lay a Degree
of Latitude, and what difference of Lon-
gitude you make therewith.

This is so common in every Booke, that I neede not to write
thereof, but only being that it is a nece sary helpe to that which
hath beeene before i spoken of, it is not amisse to set it here downe be-
ing as followeth.

First, sayling South and North you keepe still one Meridian:
and in sayling 20. English leagues you eyther rayse or depreesse the
Pole 1. deg. But if you sayle vpon the first point of Rombe from
North or South eyther Eastward or Westward you must sayle 20.
leagues, and one third part to rayse or lay a degree of Latitude: and
so having changed your Paralell one degree, you are alio departed
from your first Meridian 4. leagues that way whiche your course
was.

Apon the second point of Rombe from North or South 21.
leagues and one third, raise or lay a degree of Latitude, and your di-
stance from the Meridian is 8. leagues and one third.

Sayling vpon the thrid point 24. leagues, to raise or lay a degré,
and distance from the first Meridian is 13. leagues and one third.

Apon the fourth point 28. leagues and one third, raise or lay a
deg. of Latitude, and distance from the Meridian, is 20. leagues.

Apon the fifth point 36. leagues rai e or lay a degree of Lat-
tude, and distance from the Meridian, is 30. leagues.

Sayling vpon the sixt point of R mbe 52. leagues and one third,
raise or lay a degré, and having altered your Latitude one degree
vpon that point , you are departed from the first Meridian 48.
leagues, and one third.

If you sayle vpon the seventh point, being the next from the East
or West you must sayle 102. leagues and 2. thirds, before you raise
or lay the Pole one degré . and then are you 15. leagues from
your first Meridian b tif you sayle East or West, then are you still
in a Paralell, and neyther raise nor lay the Pole at all.

To

The Sea-mans Kalender,

To finde the distance betwene any two places, knowyng the Longitude and Latitude of them.

If the 2. places differ onely in Longitude, then are they both vnder 1. and the same Meridian: and to know the distance betwixt them in miles or leagues, multiply the number of the degres difference, by 60. miles, or 20. leagues, the Product of which multiplication giues the true distance betwene them in miles or leagues, according as you worke them, being that 60. miles or 20. leagues makes 1. degré of a great Circle: but if the one place haue North latitude, and the other South, then adde both their Latitudes together, and worke as aforesaid: and if both the places are vnder the Equinoctiall, then haue they no Latitude: And there likewise 60. miles, or 20. leagues make 1. degré, and the working like the former, if the difference be vnder 180. degrées. For if the difference be more then 180. subtract the said difference from 360. and multiply the remainder by 60. or 20. as before.

These are so plaine and easie that they neede no Examples: but if they differ both in Longitude, or in Latitude, and Longitude onely in any Paralell beside the Equinoctiall, the working is somewhat more difficult, by reason that the farther the Paralels are distant from the Equinoctiall towards eyther of the Poles, the shorter they are: and the shorter the Paralels are, the fewer min. or miles make a degre. so that whereas in the Equinoctiall 60. min. or miles make a degre. in that paralell where the pole is raised 52. deg. 37. mi. makes 1. deg. viz. 1. deg. in the Latit. of 52. running in E. or W. answers to 37. miles: for which purpose, as also for diuers necessary usses I haue here added a Table, shewing the miles of distance and minut. of Time, answerable to a degré, in every severall degré of Latitude from the Equinoctiall towards eyther of the Poles: And when you know the miles answerable to a degré in the Paralell desired, if the difference of the two places be onely in Longitude, multiply the difference of their Longitude by the number of miles answerable to a degré: and the Product sheweth the distance in English or Italian miles betwixt the said two places.

Example

The Sea-mans Kalender.

I seeke what is the greatest square number ouer the first prick, which is 1. therefore I put 1. in the quotient for the first figure of the roote, and cancell the figure ouer the first prick: then to find the second figure of the roote, I multiply the quotient by 20. which being 1. both neither multiply nor divide: therefore I seeke how often 20. is contained in 78. the number of the second prick, which you must take no other then that the square of the said number being added, therewith may be likewise taken therefrom, so I see 3. times 20. leving 60. & the square of 3. which is 9. added thereto, I put 3. in the quotient, taking 69. from 78. the number ouer the 2. prick leaues 93. to the 3. prick: then for the 3. figure of the roote, I multiply 13. the quotient by 20. the product is 260. which I seeke how often it may bee taken out of 933. and I find that 3. times 260. is 780. wherunto the square of 3. being added makes 789. therefore I put 3. in the quotient, and subtracting 789 from 933. rells 1449. for 4. prick: then for the last figure of the roote, I multiply 133. the whole quotient already found by 20. and the product is 2660. which may be taken 5. times in 14469. for 5. times 2660. is 13300. unto which 25. the square of 5. added makes 13325. therefore I put 5. in the quotient, for the fourth and last figure of the roote: and making my subtraction as afore, the worke will stand as you see, by which you may know the squares roote of the proposed number to bee 1335. and very neare $\frac{1}{2}$. So I conclude the true distance betwene Callice and Constantinople, to bee 1335. miles, and neare halfe a mile. The manner how to extract the roote of any number, is set downe more at large after the Tables of Sines.

783396	1
- 20	
1	
- 20	
3	
- 60	
9	
- 69	
783396	13
- 260	
69	13
- 260	
3	
- 780	
844	789
- 783396	133
1	9
- 2660	
69	20
- 789	
2660	
5	
- 13300	
13325	
- 94471	
13325	
783396	1335
- 169	
789	
13325	

The Sea-mans Kalender.

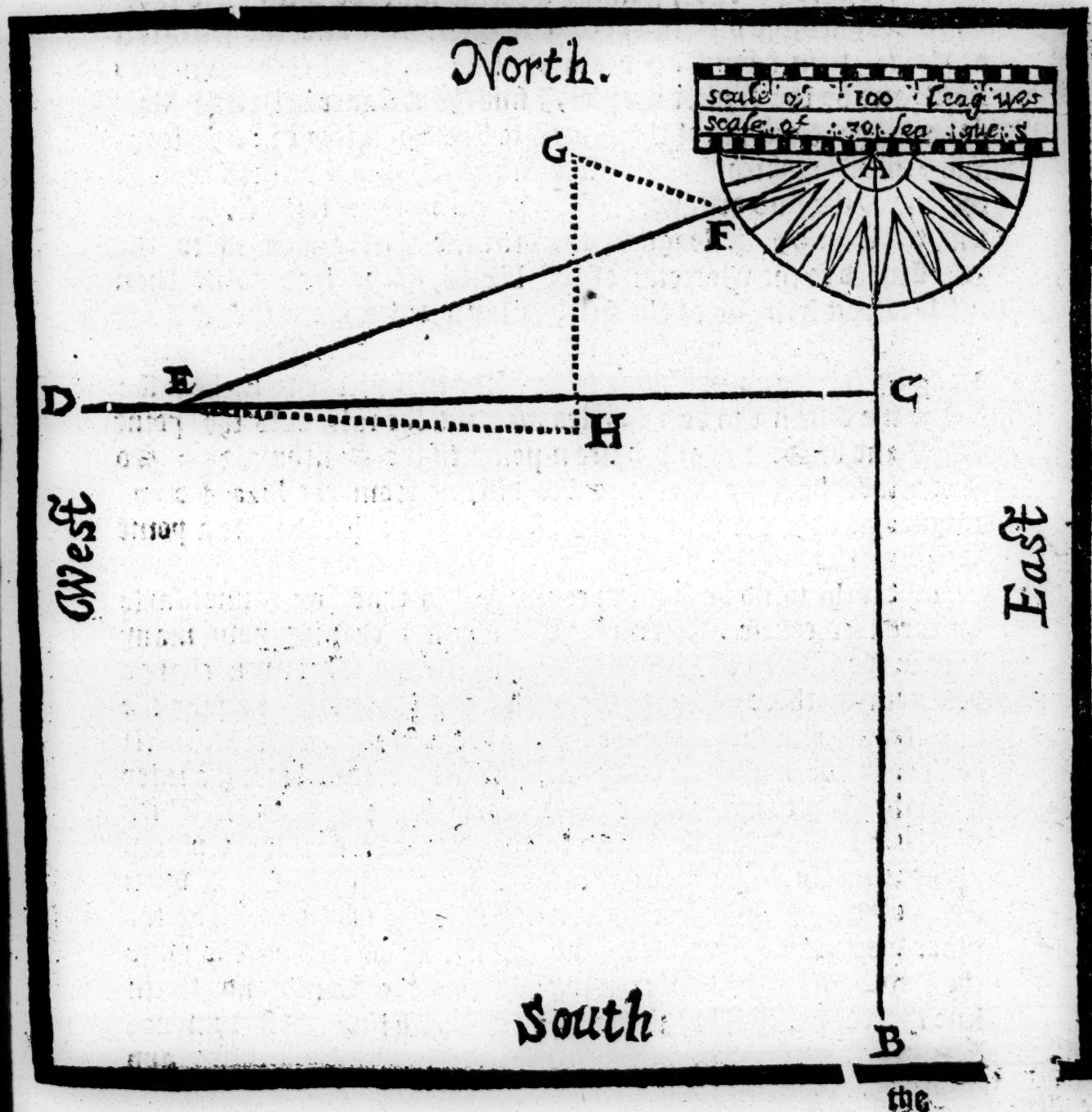
The ingenious Mariners may sayle by knowing the true Longitude & Latit. of places, to any place assigned, aswell by a blanke of paper and past-board, as by the Sea Card, by the helpe of a Protractor, in this manner: First, upon the board or paper lyned with Meridians and Paralels, or to them that can make a right Angle vpon any pricke or point, a sheete of cleane paper is sufficient to keepe a Trauerse vpon: To know your course from the place where you are, to any other place assigned: as I say vpon your board or paper, make a pricke for the place where you then are and from the said pricke drawe a right line to represen the Meridian of the same place: then placing the Center of the Protractor vpon the said pricke, lay the P. or S. point of the fly or Protractor as the place beareth, vpon the line ready drawne. Then by the last Chapter, learne the distance of miles betwixt the place where you are, and the paralell of that place you are bound to: or more briesly, what portion of the meridian is compyzed betweene the Latit. of the two places: that distance by the scale of the protractor, apply to the Meridian by you drawne, and where the distance ends, draw another line square, or at right angles to the other, either E. or West, as the scituacion of the place assigned requireth: and by the former Chapter learne the distance betwixt the Meridian by you drawne, and the Meridian of the other place assigned: which knowne (by your Scale) apply that distance to your line of East or West, and where that number of distance ends, make another pricke for the true scituacion of your place assigned: then laying a chyd or ruler from the Center of the Protractor, being the place where you are, and extending it to the other pricke last made, the edge of the ruler or line shewes vpon the protract the point of the Compasse that the place assigned beares from the place where you are: and the Scale applyed to the said line or edge of the ruler, shewes the distance: also the distance may be knowne by extracting the square root in as is before shewed, an example of this, and for the use of the Trauerse-board, and so an end.

A Ship being at the Lizard, in the Southwest parts of England, whose Longitude and Latitude I finde in the Table following to be 18. degrees. 30. minutes, and 50. deg. 10. minutes, is bound

The Seamans-Kalender.

bound so; an Iland in the Ocean sea called Maida, whose Longitude I finde in the same Table, to be 2. degrees, 40. minutes, and Latitude 46.deg.40.min. the difference of their Latitude is 3. deg.30.min. which is 210. miles, or 70.leagues; Therefore from

Type of a Trauerseboord and a Protractor.



The Sea-mans Kalender.

the prick or point A. I draw the lines A. B. in the Trauerſe board here adioyning, and vpon the point A. I place the Center of the Protractor, being one halfe of the Mariners Compasse, the middle point whereof representing the P. or S. (as occasion serues) I lay vpon the line A. B. and applying 70. leagues (whereof the scale on the edge of the Protractor containes 100.) from A. towards B. where the said 70. ends, I make a prick marked with C. so is A. C. 70. leagues, the distance betwene the Lizard and the Paralell of Maida, then from C. I draw the line C. D. at right angles to A. B. and by the former chapter, I find the distance betwene Maida, and the Meridian of the Lizard, to be 629. miles or 209. leag. and 2. miles: which by scale aforesaid applied to the line C. D. at the end of the said distance, I set a prick marked with E. so is the line C. E. 209. $\frac{2}{3}$. leagues, the distance that Maida is to the Westward to the Meridian of the Lizard, or the line A. B. then the Protract lying as at the first, I lay a ruler from the Center thereof, to the last prick E. and with the former scale, measuring along by the edge of the ruler from A. the first prick to E. the last: I find the distance to be 223. leagues, and the ruler cuts the point West and by South, and halfe a point to the Southwards: So I conclude the Isle of Maida to bee distant from the Lizard 222. leagues, and the direct course West and by South, and halfe a point Southwards.

But if the wind be scant or contrary, so that you cannot sayle by the direct course: then must you keepe a reckoning how many leagues you sayle vpon every other point: and where you change your course, there place the Center of the Protract, keepeing the Meridian or North and South line of the Protractor, Paralell to the Meridian drawne on the Trauerſe board, and laying a ruler from the Center of the Protractor, along that point vpon which the Ship maketh her way, and to the edge of the ruler so placed apply so many leagues of the scale, as the Ship hath sayled vpon that point, and then where that number ends, set a prick for the place where the Ship then is, and againe, vpon that prick place the Center of the protractor, lying as before, the South and North line thereof paralell to the Meridian or South line first drawne,

and

The Sea-mans Kalender.

and then laying a ruler to the center of the Protractor, being the place where the ship then is, and to the place assigned, it shewes vpon the Protractor, the point how they beare, and the scale applyed thereto shewes the distance, as in the former example: Ha- uing sayled from the Lizard in the right course 50. leagues, being then in the point F. the winde commeth to another point, so that she maketh her way West and by North 40. leagues: at the end of which course is the Letter G. from thence she runneth S. 75. leagues: at the end of which course is H. then from H. to know the distance, and what course must be kept to the prefirred place of Maida marked with E. I place the Center of the Protractor vpon H. and the edge thereof, which is then North and South Paralell or equidistant to the first line A. B. which so placed, I lay a ruler from the center thereof to E. and I finde the course to be West, and halfe a point to the North 125. leagues.

Note, that it is necessary to haue vpon your Protractor two se- ueral scales, a greater and a lesser, for the greater the scale is you keepe your reckoning by, the truer shall your account be.

Necessary Questions of Nauigation, with their Answers.

Question. 1.

If I saile from the Paralell of 50.degrees, 70. leagues vpon a Southwest course, I demand how much I lay or deppesse the Pole, and how many degrees and Leagues, I depart from the Meridian:

Answ. Pole depressed 2.deg. 28.min. difference of Longitude 3.deg. 25.min. leagues from the Meridian 49. and $\frac{1}{2}$.

Q. 2. If I saile from the paralell of 40.degrees vpon a West Northwest course, vntill I raise the Pole 3.deg. 30.min. I de- mand how many leagues I haue sailed: and how many degrees and leagues I haue departed from the Meridian?

A. Leagues sailed 183. difference, Longitude 12. deg. 11. min. leagues from the Meridian 169.

The Sea-mans Kalender.

Q. 3. From the Paralell of 47. deg. if in sayling 108. leagues betweene West and North, I raise the pole 3. deg. I demand vpon what Rombe I haue sailed : as also how many deg. and leagues I am from the Meridian, from whence I began that course :

A. A Rombe Northwest and by west, difference Longitude 6. degrēes 36. minutes leagues from the Meridian 90.

Q. 4. If from the Paralell of 50. deg. I saile so long betwene North and East, till I raise the Pole 6. deg. and departe from the Meridian 4. degrēes, I demand vpon what point of the compasse I haue sailed, and how many leagues I haue runne :

A. The course is neare North Northeast, leagues runne 126.

Q. 5. If from the Paralell of 50. degrēes I saile Northwest, vntill I am 4. deg. from the Meridian where I began my course. I demand how many leagues I haue sailed, and how much the Pole is raised :

A. Leagues sailed 70. and two thirds, Pole raised two degrēes and a halfe.

Q. 6. Two Ships departing from one place of the Paralell of 50. degrēes the one in sayling 145. leagues towards the West, hath raised the Pole 4. deg. and the other hath raised the Pole 7. degrēes and is 95. leagues West from the Meridian of the place from whence he began his course : I demand by what course the said Ships haue sailed, how many leagues the two ships haue sailed, how farre they be a sunder, and by what course they may mette :

A. The first ship hath sailed Northwest and by west : The second hath sayled Northwest by North 172. leagues, they are a sunder 63. leagues, and the course betwene them is North North East, and South Southwest.

Q. 7. Two Ships departing from one place in the Paralell of 50. degrēes, the one in sayling 145. leagues, towards the West, hath raised the Pole 4. degrēes, and the other hath raised the Pole 7. degrēes and is 93. leagues West from the Meridian of the place from whence he began that course : I demand, by what course the said Ships haue sailed the way of the two ships, how farre they be a sunder, and by what course they may mette :

A. The first Ship hath sailed Northwest and by West, the second

The Sea-mans Kalender

second hath sayled Northwest and by North 168. leagues, they are a funder 64. leagues 3. deg. Easterly, course betweene them is North Northeast.

Q. 8. Two shippes sayling from one place in the Paralell of 60. deg. the one sayling 180. leagues Eastwards, hath raised the Pole 3. deg. I demand upon what course, and how many leagues the other shipp shall saile, to bring himselfe 50. leagues North by West from the first shipp, and what they are both departed from their first Meridian?

A. The first shipp hath sailed Northeast and by East, and is departed from the meridian 146. leagues. The second shipp must sayle Northeast 3. deg. Northerly, leagues 220. and is departed from the Meridian where he began his course 169. leagues.

Q. 9. If I saile from the Paralell of 50. deg. 100. leagues North, I demand wher, at Latitude I am in?

A. In the Latitude of 55. degrees.

Q. 10. If I sayle from the Paralell of 50. deg. South, till I lay the Pole 5. deg. I demand, how many leagues I haue sayled?

A. 100. Leagues.

Q. 11. If from Latitude 22. deg. I sayle in the Paralell of 60. deg. 100. leagues East, I demand, what longitude I am in?

A. In Longitude 32 degrees.

Q. 12. If from Longitude 22. deg. I saile in the Paralell of 50. deg. to longitude 10. degrees. I demand how many leagues I haue sayled?

A. Leagues 154. and a quarter.

Q. 13. If I sayle from Longitude 20. deg. and Latitude 40. to Longitude 350. deg. 27. min. and Latitude 30. deg. I demand the rombe and distance?

A. Course West Southwest, distance 520. leagues.

Q. 14. From Longit. 20. deg. and Latit. 45. deg. Northeast 20. leagues, what Longit. and Latitue hath the second place?

A. Twenty three deg. Longitude 45. deg. 42. min. Latitude.

Q. 15. From Longitude 23. deg. and Latitude 45. deg. 42. min. East and by North 30. leagues, what Longitude and Latitude hath the second place?

The Sea-mans Kalender.

A. 25.deg.9.min. Longitude, 46. degrees 5. min. Latitude.

Q. 16. From Longitude 25 deg. 9. min. and Latitude 45. deg. 59. min. East Southeast 25. leagues. What Longitude and Latitude hath the second place?

A. 26.deg.46.min. Longitude, 45.deg. 31. min. Latitude.

Q. 17. From Longitude 26. deg. 53. min. and Latitude 45. deg. 31. min. North 40. leagues. What Longitude and Latitude hath the second place?

A. Longitude 26.deg.53.min. Latitude 47.deg. 31. min.

Q. 18. From Longitude 26. deg. 53. min. and Latitude 47. deg. 31. min. 50. leagues West Northwest. What Longitude and Latitude hath the second place?

A. Longitude 23.deg.57. min. Latitude 48.deg. 28. min.

Q. 19. From Longitude 23. deg. 57. min. and Latitude 48. deg. 28. min. East Northeast 60. leagues. What Longitude and Latitude hath the second place?

A. Longitude 28.deg. 27. minutes, Latitude 49. degrees 26. minutes.

Here followeth a briefe Tables of Sines for Arithmeticall Calculation, the totall sine whereof is 10000. with certaine necessary Propositions to be wrought thereby, by which few things proposed, and Example thereto annexed, any one that hath either an ingenious spirit, or a willing minde to the practise of the Mathematicall Sciences, may attaine to much knowledge therein.

A briefe declaration of the same.

VVhat the Table of Sines is, hath bene very Learnedly explained by others, and therefore nedeless is it for me to discourse thereof; onely take the e few instructions for the helpe of those, which as yet haue no knowledge therein. First, know, that

The Sea-mans Kalender.

that sayling, which is the principall thing here aymed at, is performed by a true and perfect knowledge of the Spheare, by the p[re]ie-
tion wherof, all calculations, Tables calculated, and Instruments
for obseruation are invented, protracted, framed and made.

What the Spheare is, I need not to discusse, the chiese or great
Circles therof consisting of 360. deg. and one quarter thereof being
90. deg: which quarter being taken from the whole circumference,
consisteth of these thre particulars, viz. An arch or part of a Circle
being indeed 90. deg. or a quarter of the whole Circle: right An-
gle, & two equall sides thereto, of which the one is the base or ground
lyne, the other a perpendicular let fall theron at right Angles, the
utmost ends or extentiones, of which two lines are the limits of the
aforesaid arch, or quarter of a Circle: the which thrē parts so fitted
together in there due order, sheweth the perfect platfrome of one
quarter of the whole Circle, commonly called a Quadrant: the
base or ground lyne wherof being deuided into 10000. equall
partz, is Sines totus or the whole sine: and the whole arch or quar-
ter of a Circle into 90. degrees is the whole arch belonging to the
said whole sine.

Within which Quadrant, any number of deg. or min. counted
from the beginning or first perpendicular may be called an arch, or
part of a Circle: and another perpendicular let fall therefrom to
the aforesaid base or ground line, the number of equall parts that
said perpendicular falleth vpon, is the right sine to the arch giuen:
and the complement of the arch giuen, is the remainner thereof it be-
ing taken from 90. deg. or the whole quadrant. To find out the
right sine of any giuen Arch, looke in the head of the Table follow-
ing for the deg. thereof, and if there be any minutes therewith, looke
for the minutes at the left side of the Table, and carrying your eye
downeward from the degrē, till you come right against the min.
the number which you find in the common Angle to them both, is
the right sine of your giuen arch desired: as if you desire the sine of
35. deg. 20. min. looke in the head of the Table for 35. and vpon the
left side thereof for 20. and in the common square or angle right a-
gainst them both, you shall finde 5783. which is the sine of 35.deg.
20. min. and if you subtract 35.deg. 20. min. from 90.deg. the re-

The Sea-mans Kalender.

maine 54. deg. 40. min: is þ complement thereof, whose right sine (found as before is taught) is 81 58. what the versed sine is, and how found out, is afterward shewed. I doubt not but that these few wordes will suffice for þ explaining of the Table following, whose large and ample vses for Navigation and other the Mathematical practises, these following exemplary propositions, will in some reasonable sort make manifest: by which few haere proposed and answered, the ingenious may gather the manifold vses thereof, being that indeed the benefit to be reaped thereby is great, and the propositions to be wrought thereby infinite. Who so desires more perfection in this kinde of Navigation, and generally in all Mathematicall practises, let them spend some time in the study of Pitiscus of the Doctrine of Triangles, not long since translated and published in our English tongue by Mr. Raph Henson.

Certaine Propositions to be wrought by the Table of Sines.

The Sunnes true place being knowne, to finde
his Declination.

Prop. 1.

As the whole Sine is to the sine of the greatest Declination, so is the sine of the Sunnes dillance from the nærest Equinoctiall point, to the sine of the declination for the day proposed.

Ex ample.

I would know the Declination of the Sun the 1. of May 1630. at what time the true place of the Sun being in 20. d. g. 36. min of Taurus, is 50. d. 36. min. from the beginning of Aries or the vernall Equinoctiall point, therefore I must multiply the sine of 50. degr. 36. min. the Sunnes dillance from the Equinoctiall point by the sine of 23. deg. 31. min. the greatest declination, and that product must be deuided by the whole sine, whose severall sines being found out in the Table following, and set in order, the worke will stand thus

— If 90. giue 23.31. What 50.36.

10000: 3990. 7727.

Facit, 3083. whose nærest arch 17.57 minutes, is the true Declination of the Sunne, the day and yere aforesaid.

The

The Sea-mans Kalender.

The Declination of the Sunne giuen, to finde his place in the Zodiacke. Prop. 2.

As the sine of the greatest Declination is to the whole sine, so is the sine of the Declination for the day proposed to the Sunnes place or distance from the nearest Equinoctiall point.

Example.

The first of May, 1626. I finde that the Declination of the Sun is 17. degrees 57.minutes North, therefore I say:

If 23.31. giue 90. what 17.57.

3990. 10000. 3083.

Facit, nearest to 7727. whose arch 50.deg.36.min. is the Sunnes distance from the vernal Equinoctiall point of Aries, from which taking 30. degr. the whole sine of Aries, the remainder 20.deg.36. min. shewes the Sunne to be so much entred into Taurus, which is the next signe.

The Latitude and Declination of the Sunne giuen,
to finde the Amplitude.

Prop. 3.

As the sine of the Complement of the Latitude is in proportion to the whole sine, so is the sine of the Sunnes Declination to the Amplitude.

Example.

The 10. of Aprill 1628. I desire the Amplitude of the Sun, viz. how much the Sunne dothrise and set from the true East and West point of the Horizon, towards the North or South in the Latitude of 51.deg. 40.min. to know whiche, the worke is thus.

If 38. deg. 20.min. the complement of the Latitude, giue 90. degrees the arch of the whole sine, what giues 11.deg. 48.min. the Declination of the Sunne.

38 deg. 20.min. 90. 11.48. minutes.
6202. 10000. 2045.

Facit, 3297. nearest whose arch sought out in the Table of sines, is 19. degr. 15. min for the Amplitude in the day, yere and place proposed: the same deuided by 11. and 1. quarter, the number of degrees that belongs to a point of the Compasse, sheweth one

The Sea-mans Kalender.

point and 8. degrees which the Sunne riseth and sets to the Northward of the East and West, being that the Declination is North, so if the Declination were S. then were the Amplitude southerly.

The Declination and Amplitude of the Sunne giuen, to finde the height of the Pole.

Prop. 4.

As the Sine of the Amplitude is in proportion to the sine of the Declination, so is the whole sine to the sine of the complement of the Latitude.

Example.

The Declination 11. degt. 43. min. and the Amplitude 19. deg. 7. minutes, I demand the height of the Pole : Say,

If 19. 7. give 11.43. what 90.

3275. 2031. 10000.

Facit, 6202. nearest whose arch in the Table of sines being 38. degrees 20. minutes is the height of the Equinoctiall, or the complement to the Latitude : that subtracted from 90. degrees, leaves 51. degrees 40.minutes, for the height of the Pole or Latitude of the place desired.

The true place and Declination of the Sunne giuen, to finde the right ascension. Prop. 5.

As the Sine of the Complement of the Declination is to the totall sine, so is the sine of the complement of the Sunnes distance from the beginning of Aries, to the Complement of the right ascension.

Example.

I desire the right ascension of the Sun the 20. of Aprill. 1629. being then in 1 c.de. 14. min. of Taurus, at which time his Declination is 14. deg. 56. min. and the complement thereof 75. deg. 4. min. and the distance from the beginning of Aries, 40.deg. 14. min. whose complement is 49.deg. 49. minutes : I say then,

If 75.4. give 90. what 49.49. minutes ?
9663. 10000. 7634.

Facit,

The Sea-mans Kalender.

Facit, 7900. whose arch in the Tables of Sines is 52. degrēes 11. min. the complement whereof 37.deg.49 min. is the Sunnes right ascension: the same conuerted into houres by allowing 15. deg. to an houre, giues two houres and 31. minutes.

This is to be understand, when the Sunne is betwixt the beginning of Aries, and the Tropike of Cancer, for if the Sunne be in the Tropike of Cancer, then is the right ascension 90.deg. 02 6. houres: and if the Sunne be betwixt the Tropike of Cancer, and the Equinoctiall point of Libra, subtract the distance that the Sun is from the beginning of Aries, out of 180. degrēes, and with the remainder worke as before for the right ascension, which ascension so found, take from 180. and the remainder is the right ascension desired, But if the Sunne be betwixt the Equinoctiall of Libra, and the Tropike of Capricorne, subtract the said distance from the beginning of Aries, out of 270. degrēes; and if betwixt the Tropike of Capricorne, & the beginning of Aries, take the said distance out of 360. degrēes, and then worke as before. One Example or two will make all this plaine vnto you.

The last of Iune 1630. the true place of the Sunne 17. degrēes, 51. min. of Cancer, is 107. deg. 51. minutes from the beginning of Aries, which taken from 180. leaves 72. deg. 9. minutes, whose complement is 17. degr. 51. minutes, the Sunnes Declination being then 22.degr. 20. min the complement thereof 67. degr. 40. minutes. Say then,

If 67.40. giue 50. what 17.51. minutes?
9250. 10000. 3065.

Facit, 3314. whose arch is 19.deg. 21. min. y complement whereof 70.deg. 39. min. taken from 180. leaves 109.deg. 21. min. for the right ascension desired, which conuerted into houres, makes 7. houres 16. minutes. Againe, I desire the right ascension of 20.deg. 40. min. of Capricorne, whose distarce in continuall proceeding from the beginning of Aries, being 290.deg. 40. min. taken from 360. leaves 69.deg. 20. minutes, with the complement whereof 20.deg. 40. min. and the complement of the Declination of the Sunne vpon the same point of the Sunnes place 68.deg. 6. min. I worke as followeth.

The Sea-mans Kalender.

If 68.6. giue 90. what 20.4°.

9278. 10000. 3539.

Facit, 3803. whose arch is 22. deg. 21. min. the complement whereof 67.deg. 39. min. taken from 360. leaves 292. deg. 21. min. for the right ascension desired, the same converted into hours, is 19 hours 29. minutes.

The Latitude and Declination of the Sunne knowne, to finde the difference ascensionall.

Prop. 6.

As the sine of the Complement of the Latitude, is to the sine of the latitude, so is the sine of the Declination to the quotient found: againe, as the sine of the complement of the Declination is to the whole sine, so is the said quotient found to the difference ascensionall.

Example.

I would know the difference ascensionall, when the Declination is 20.deg. 6.minutes, and the latitude 51. degrees 40. minutes? I say,

If 38.20. giue 51.40. what 20. 6.

6202. 7844. 3437.

Facit, 4346. for the quotient found: then againe, I say,

If 69.54. giue 90. what

9391. 10000. 4346.

Facit, 4627. whose arch in the Table of sines, 27. degrees 34. minutes is the difference ascensionall for the day proposed: the same reduced into hours and minutes, makes one hour and 50. minutes, which taken from 6. a clocke, the hour that the Sunne riseth, being in the Equinoctiall, leaueth 4. hours. 10. min. at what time the Sunne then riseth, and the said ascensionall difference added to 6. a clocke, makes 7. a clocke, 50. minutes, for the Sunne rising.

Againe, the said ascensionall difference doubled and added to 12. hours, the time from 6. in the morning till 6. at night, makes 15. hours 40. minutes for the whole length of the day.

This is when the Sunne hath North Declination, for if the Declination

The Seamans-Kalender.

Declination be South, then the ascencionall difference added to 6. a cloke, gives the Sunnes rising, and taken from 6. leaves the setting, and being doubled and taken from 12. heures, leaues the length of the day, as aforesaid.

The Amplitude and difference ascencionall of the Sunne
or Starres giuen, to find the Declination.

Prop. 7.

As the sine of the time of the Sunnes rising, conuerted into degrees and minutes, is to the sine of the complement of the Amplitude, so is the whole sine to the sine of the complement of the Declination.

Example.

The difference ascencionall being 27.deg.34.min. shewes the Sunne to rise at 4. a cloke 10.min. which conuerted into degrees, makes 62.deg.30.min. and the Amplitude being found as before is shewed, in the third Proposition, is 33.deg.38.min. and the complement thereof 56.deg.22.min. Say then,

If 62.30. gives 56.22. what 90.

8870. 8326. 10000.

Facit, 9386. whose arch 69.deg.50.min. the complement thereof 20.deg.10.min. is the Declination desired.

The Latitude and Declination giuen, to finde
the Meridionall Altitude.

Prop 8.

If the Sunne haue North Declination, adde the complement of the Latitude with the Declination, the product is the Meridional Altitude.

Example.

If the Declination be 23. deg. 30. min. North, and the Latitude 51.degrees 40.minutes, the complement thereof 38.degrees, 20. added with 23.30. minutes, make 61.degrees 50.minutes, for the Meridian Altitude: but if the Declination be 23. deg. 30. South, and the Latitude 51.degrees 40. minutes, subtract 23. degrees 30.minutes. the Declination from 38.degrees 20.minutes

the

The Sea-mans Kalender.

the complement of the Latitude, and the remainer 14.deg. 50.min. is the altitude desired: and if the Sunne be in the Equinoctiall, having no Declination, then is the Meridian altitude equall to the complement of the Latitude.

The Latitude and Declination knowne, to find the height of the Sunne at any hour of the day.

Prop. 9.

First, you are to consider, whether the Sunne be in the Equinoctiall, or whether he hath North or South Declination, for if the Sunne be in the Equinoctiall, then as the whole sine is to the sine of the complement of the Latitude, so is the sine of the complement of the Sunnes distance from noon, allowing 15.deg. for every hour to the sine of the altitude desired.

Example.

At any yere or day, the Sunne then having no Declination, the Latitude 51.deg. 40. min. I desire the Sunns height at 9. a clocke before noon, or at 3. after noon, the complement of the Latitude is 38.deg 20. minutes and the hours distance from noon, 45. degr. whose complement is also 45.deg. Say then,

If 90. give 38.20. What 45.

10000. 6202. 7071.

Facit, 43 85. whose arch 26. deg. is the height of the Sun aboue the Horizon, the time and place proposed.

If the Sunne haue Declination, then is the working somewhat more tedious, except onely at 6.a clock, either before or afternoone: for which hour, as the whole sine is to the sine of the Latitude, so is the sine of the Declination, to the sine of the Altitude.

Example.

The 10. of Aprill 1624. the Latitude 51.deg. 40.min. and the Declination 11. deg. 48.min. Say,

If 90. give 51.40. What 11.48.

10000. 7844. 2045.

Facit, 1604. whose arch 9.deg. 14.min. is the Altitude desired. But for any other hour of the day, if it be lesse then 6. hours,

The Sea-mans Kalender.

or 90. degr. worke as followes , multiply the sine of the houres distance from noone by the sine of the complement of the Latitude, the product deuide by the whole sine , and the arch of the quotient taken from 90. set apart for y number first found, which number so found, compare with the latitude, then multiply the whole sine, by the sine of the lesser, and deuide the Product thereof by the sine of the greater : and to the complement of the arch of the product adde the declination of the Sunne if the Declination be Northerly, or subtract if the Declination be Southerly, and if the Product or remainder be more then 90. degrees take it from 180. and the rest is the second found number, which two numbers so knowne.

As the whole sine is to the number first found , so is the second found number to the Altitude desired,

Example.

Any yere or day at 8. a clocke the Latitude 51. degr. 40. minut, the distance of the Sunne from noone 45. deg. and the Declination 11. degr. 43. minutes, I desire the Sunnes height: Say,

If 90. giue 38. 20. what 45.

10000.	6202.	7071.
--------	-------	-------

Facit, 4385. whose arch 26. deg. taken from 90. leaues 64.deg. for the first found number, then comparing the latitude, and it together, the Latitude being the lesser, I multiply the whole sine by the sine thereof, and deuide by the sine of the first found, saying,

If 64.0. giue 51.40. what 90.

8988.	7844.	10000.
-------	-------	--------

Facit, 8717. whose arch being 60.deg.46. min. to the Complement thereof 29.deg. 14. min. I adde the Declination 11.degr.43. minutes, and the totall 40.degr. 57. min. is the second found number, which two numbers so knowne, say againe.

If 93. giue 64. 0. what 40.57.

10000.	8988.	6554.
--------	-------	-------

Facit, 5890. whose arch 36.deg.5. minutes, is the Altitude of the Sunne desired.

Againe, if the houre for which you desire the Sunnes height, be more then 6. houres or 90. degrees from the Meridian , you must

The Sea-mans Kalender.

must subtract the said distance from 180. and multiply the sine of the remainder, by the sine of the complement of the latitude, which product being deuided by the whole sine , the complement of the quotients arch is the first found number, the sine whereof compare with the sine of the Latitude , multiplying the whole sine by the lesser : and deuiding the product by the greater : from the arch of which quotient, if you take the complement of the Declination, you haue the second found number , the sine whereof multiplied by the sine of the first found , and the product deuided by the totall sine, the quotients arch is the Altitude desired.

Example.

At 5. in the morning, the Latitude 51.deg.40.min. the houres distance from noone 7 02 105. deg. which deducted from 180. leaves 75. degr. for the houres distance, Say then.

If 90. giue 38.60. what 75. 0.

10000. 6202. 9659.

Facit, 5990. whose arch being 36.deg.48.min. the complement thereof 53. 12. is the first found number : Say then againe,

If 53. 12. giues 51.40. what 90.

8007. 7844. 10000.

Facit, 9796. from whose arch 78.deg.25.min. taking 78.degr. 17.min. the complement of the Sunnes Declination, rells 8. min. for the second found number, which 2. number found, Say,

If 90. giue 53. 12. what 08.

10000. 8007. 023.

Facit, 18. whose arch 6. min. is the height of the Sunne above the Horizon at 5. in the morning, or 7. in the euening, the day and time aforesaid.

The Latitude giuen, to find how many minutes or miles of the Equinoctiall, makes a degree of Longitude in any paralell.

Prop. 10.

As the whole Sine is in proportion to 60. so is the sine of the complement of the Latitude, to the miles answerable to a degree in the Latitude desired.

3 de,

The Sea-mans Kalender.

I desire to know how many miles in running East or West in
the Latitude of 51. deg. 40. minutes, will alter one degree of Lon-
gitude: Say,

If 90. give 60. what 38. 20.
10000. 6204.

Facit, 37. for the number of miles answerable to a degree in the
Latitude desired.

The Course and distance given, to finde out the
difference of Latitude.

Prop. 11.

As the whole sine is to the miles of way runne, so is the sine of
the courses distance from East to West, the minutes of diffe-
rence of Latitude.

Example.

Running West Southwest, which is 22.deg. 40.minutes, from
the West 75. leagues or 225. miles, I demand the difference of
Latitude: Say,

If 90. give 225. what 20.30.
10000. 3827.

Facit, 86. minutes or one deg. 26.min. for the difference of La-
titude vpon the said course and distance.

By Course and distance given, to finde the
difference of Longitude.

Prop. 12.

As the whole sine is to the miles of way that you have run, so is
the sine of the deg. that your course is distant from South or
North to the miles that you are departed from your first Meridian.

Example.

Running Northwest and by North which is 33. degr. 45. min.
from the North 60. leagues or 180. miles, I demand the difference
of Longitude: Say,

If 90. give 180. what 33.45.
10000. 5556.

Facit, 100. miles which you are departed from the Meridian

The Sea-mans Kalender.

to the Westward, which if you diuide by the number of miles answerable to a degré of Longitude, in the Latitude where you then finde your selfe to be, the quotient giues you the degr. and minut. of the difference of longitude.

By the distance and departure from the Meridian giuen, to find the course.

Prop. 13.

As the miles of distance that you haue runne, is in proportion to the whole Sine, so is the miles of your departure from the Meridian to the sine of your course from South to North.

Example.

Being departed from the first Meridian 75. miles in the running of 50. leagues, or a 150. miles, I demand upon what point I haue sayled, it being betwixt South and West : Say,

If 150. give 10000. what 75.

Facit, 5000. whose arch 30. deg. is the distance from South towards West that the course is, which is Southwest and by South southerly.

The Latitude, Declination and height of the Sunne giuen, to know the houre of the day.

Prop. 14.

Adde the complement of the Latitude, and the Declination together, and from the sine of the totall, subtract the sine of the Altitude obserued, the remainer is your number first found, which number first found, multiply by the whole sine, and deuide by the sine of the complement of the Latitude, the quotient whereof is the second found number, which second number so knowne, as the sine of the complement of the Declination is to the totall sine, so is the said second found number to the quotient, which quotient taken from the whole sine, the complement of the arch to the remainer, is the Sunnes distance from noone in degrees and minutes.

Example.

The 15. of May 1625. the Declination 21.deg.4.minutes, and the

The Seamans-Ralender.

the complement of the Latitude 38. deg. 20. min. added together, is 59. deg. 24. min. the sine thereof 8607. the height of the Sunne observed 48.deg. 30.m. the sine thereof 7090. the which taken from the former number, leaues 1117. for the first found number: then I say,

If 68.20.	giue	90.	what
6201.		10000	1117

Facit, 1801. for the second found number. Againe say,

If 68.56.	giue	90.	what
9332.		10000.	1801

Facit, 1929. which taken from 10000. leaues 8071. whose arch 53.deg.49.min. subtracted from 90. leaues 36.deg.11.min. for the Sunnes distance from the Meridian: that conuerted into houres, is 2. houres 24. min. from noone, when the Sunne is so high as aforesaid.

To finde the Sinus versus of any giuen Arch.

Prop. 15.

If the arch giuen, be lesse then 90. subtract it from 90. & the sine of the remaine taken from the totall sine, leaues the Sinus versus, but if the giuen arch be greater then 90.deg. subtract 90. deg. therefrom, and seeke the sine of the remaine, which is alwaies the complement of the giuen arch: whch Sinus adde to the whole sine, and the totall thereof, is the Sinus versus of the giuen arch desired.

Example.

To know the Sinus versus of 47.deg. 12. min. the complement thereof, is 42.degrees, 48. minutes. whose sine 6794. taken from 10000. the whole sine resteth 3206. the reuersed sine of 47.deg. 12 minutes.

Likelwise, to know the reuersed sine of 437. deg. 25. minutes, which is more then 90. deg. taking 90. therefrom; there resteth 47.degrees 25 minutes, the Sinus whereof 7363. added to the whole sine, maketh 17363. for the reuersed sine of 137. degrees 25.minutes.

A table of Sines.

The Degrees of the Quadrant.

M.	0	1	2	3	4	5	6	7	8	9
1	3	177	351	526	700	874	1848	1222	1395	1567
2	6	180	353	529	703	877	1051	1224	1398	1570
3	9	183	355	532	706	871	1054	1227	1400	1573
4	12	86	61	35	09	83	57	30	03	76
5	14	88	62	38	12	86	60	33	06	79
6	17	92	66	41	15	89	63	36	09	82
7	30	95	69	44	18	92	65	32	12	84
8	23	93	72	47	11	95	68	42	15	87
9	26	201	71	49	4	98	71	45	18	90
10	29	04	7	52	25	90	74	47	21	93
11	32	06	8	55	26	03	77	50	24	96
12	25	09	84	58	33	06	80	53	26	99
13	38	12	87	61	35	09	83	56	29	1602
14	41	15	9	64	38	12	86	59	32	05
15	44	18	9	67	41	15	89	63	35	08
16	45	21	96	70	44	18	91	65	38	10
17	49	24	98	73	47	21	94	68	41	13
18	52	27	401	76	50	24	97	71	44	16
19	55	30	01	78	53	27	100	73	46	19
20	58	33	07	81	56	30	03	76	49	22
21	61	25	10	84	58	32	06	79	52	25
22	64	38	13	87	61	35	09	82	55	27
23	67	41	16	90	64	38	12	85	58	30
24	70	44	19	93	67	41	15	88	61	33
25	73	47	22	96	70	44	18	91	64	26
26	76	50	25	99	73	47	20	94	67	39
27	78	53	27	602	76	50	23	97	69	42
28	81	56	30	05	79	53	26	99	72	45
29	84	59	33	08	82	56	29	120	75	48
30	87	62	36	10	85	59	32	05	78	51

A Table of Sines

The Degrees of the Quadrant

M.	1	2	3	4	5	6	7	8	9
31	90	265	439	613	787	96	1135	1308	1481
32	91	263	442	616	790	954	1138	1311	1484
33	93	270	445	619	793	967	1141	1314	1487
34	99	73	48	23	96	76	44	17	90
35	102	76	51	25	99	77	46	20	92
36	85	79	54	28	802	76	49	22	95
37	07	82	56	31	5	79	52	23	98
38	10	85	59	34	68	82	55	28	1501
39	13	88	62	37	11	85	58	31	73
40	16	9	65	40	14	88	61	04	76
41	18	94	68	42	16	90	64	34	07
42	22	97	71	45	19	9	67	37	10
43	25	300	74	48	22	96	70	40	1
44	28	03	77	51	25	99	72	43	88
45	31	05	80	54	28	100	77	46	18
46	34	08	83	57	31	0	78	51	91
47	37	11	85	60	34	0	81	24	96
48	40	14	88	63	37	1	84	27	99
49	43	17	91	66	40	1	87	30	1702
50	45	20	94	68	43	1	87	60	05
51	48	23	97	71	46	1	90	63	08
52	51	26	500	74	48	2	0	66	1
53	54	29	03	77	51	2	96	69	4
54	57	31	06	80	54	2	98	7	30
55	60	34	09	82	57	3	1201	74	19
56	6	37	12	85	60	34	04	77	21
57	66	40	15	89	63	27	07	80	25
58	69	43	17	91	66	2	1	82	28
59	72	47	20	93	69	42	13	85	3
60	74	50	23	97	71	45	16	88	34
							19	92	36

A table of Sines.

The Degrees of the Quadrant.

M.	10	11	12	13	14	15	16	17	18	19
1	1739	1911	2082	2252	2422	2591	2759	2926	3093	3258
2	42	14	85	55	25	94	62	29	96	61
3	45	17	88	58	28	97	69	32	98	64
4	47	19	90	61	30	99	67	35	3101	67
5	50	22	93	64	33	2602	70	38	04	69
6	53	25	96	67	36	05	73	40	07	72
7	56	28	99	69	39	08	76	43	09	75
8	59	31	2102	73	42	11	79	46	12	78
9	62	34	05	75	45	13	81	49	15	80
10	65	37	07	78	47	16	84	51	18	83
11	67	39	10	81	50	19	87	54	20	86
12	70	42	13	83	53	22	90	57	23	89
13	73	45	17	86	56	25	93	60	26	91
14	76	48	19	89	59	28	95	63	29	94
15	79	51	22	92	62	30	98	65	32	97
16	82	54	25	95	64	33	2801	68	34	3300
17	85	57	27	98	67	36	04	71	37	02
18	88	59	30	2300	70	39	07	74	40	05
19	90	62	33	03	73	41	09	76	43	08
20	93	65	36	06	76	44	13	79	46	11
21	96	68	39	09	78	47	15	82	48	13
22	99	71	42	12	81	50	18	85	51	16
23	1802	74	45	15	84	53	21	88	54	19
24	05	77	47	17	87	55	23	90	56	22
25	08	79	50	20	90	58	26	93	59	24
26	10	82	53	3	92	61	29	96	62	27
27	13	85	56	26	95	64	32	99	65	30
28	16	88	59	29	98	67	35	3001	67	32
29	19	91	61	31	2501	69	37	04	70	35
30	22	94	64	34	04	72	40	07	73	38

A Table of Sines.

The Degrees of the Quadrant.

M.	10	11	12	13	14	15	16	17	18	19
31	1825	1996	2167	2337	2507	2675	2843	3010	3176	3341
32	28	99	70	40	09	78	46	13	78	43
33	30	2002	73	43	12	81	48	15	81	46
34	33	05	75	46	15	83	51	18	84	49
35	36	08	78	49	18	86	54	21	87	52
36	39	11	81	51	21	89	57	24	89	54
37	42	14	84	54	24	92	60	26	92	57
38	46	16	87	57	26	95	62	29	95	60
39	48	19	90	60	29	98	65	32	98	63
40	50	22	93	63	32	700	68	35	3201	65
41	53	25	96	65	35	03	71	37	03	68
42	56	28	98	68	38	06	74	40	06	71
43	59	31	2201	71	40	09	76	43	09	74
44	62	34	04	74	43	12	79	46	12	76
45	65	36	07	77	45	14	82	49	14	79
46	68	39	10	80	49	17	85	51	17	82
47	70	42	13	82	53	20	87	54	20	83
48	73	45	16	85	55	23	90	57	23	87
49	76	48	18	88	57	26	93	60	25	90
50	79	51	21	91	60	28	96	62	28	93
51	82	53	24	94	63	31	99	65	31	96
52	85	56	27	97	66	34	2901	68	34	98
53	88	59	30	99	68	37	04	71	36	3401
54	91	62	31	2402	71	40	07	73	39	04
55	94	65	35	05	74	42	10	76	42	06
56	95	68	38	09	77	45	13	79	45	09
57	99	70	41	11	80	48	15	82	47	12
58	1902	73	44	14	83	51	18	85	50	15
59	05	76	47	16	85	54	21	87	53	17
60	08	79	49	19	88	56	24	90	56	20

A Table of Sines.

The Degrees of the Quadrant.

M.	20	21	22	23	24	25	26	27	28	29
1	3423	3386	3749	3910	4070	4229	4386	4542	4697	4851
2	26	89	51	13	73	31	89	45	4700	53
3	28	93	54	15	75	34	91	48	02	56
4	31	94	57	18	78	37	94	50	05	59
5	34	27	59	21	81	39	96	53	07	61
6	37	3600	62	23	83	42	99	55	10	63
7	39	03	65	26	86	45	4402	38	13	66
8	42	05	68	29	89	47	04	61	15	68
9	45	08	70	31	91	50	07	63	18	71
10	47	11	73	34	94	52	1	66	20	73
11	50	13	76	37	96	55	12	68	23	76
12	53	16	78	39	99	58	15	71	25	78
13	56	19	81	42	4102	60	18	73	28	81
14	58	22	84	45	04	63	20	76	31	83
15	61	24	86	47	07	66	23	79	33	86
16	64	27	89	50	10	68	25	81	36	88
17	67	30	92	53	12	71	28	84	38	91
18	69	32	94	55	15	74	31	86	41	93
19	72	35	97	58	1	76	33	89	43	96
20	75	38	3800	61	20	79	36	92	46	98
21	77	41	03	63	23	81	38	94	48	4901
22	80	43	05	66	26	84	41	97	51	04
23	83	46	08	69	28	87	44	99	54	06
24	86	49	11	71	31	89	46	4602	56	09
25	88	51	13	74	34	92	49	04	59	11
26	91	54	16	77	36	95	51	07	61	14
27	94	57	19	79	39	97	54	10	64	16
28	97	60	21	82	42	4300	57	12	66	19
29	99	62	24	85	44	02	59	15	69	21
30	3502	65	27	87	47	05	62	17	71	24

A Table of Sines

The Degrees of the Quadrant.

M.	20	21	22	23	24	25	26	27	28	29
31	3505	3668	3829	3990	4149	4308	4464	4620	4774	4927
32	07	70	31	93	52	10	67	23	77	29
33	10	73	35	95	55	13	70	25	79	32
34	13	76	37	98	57	16	72	28	82	34
35	16	79	40	4001	60	18	75	30	84	37
36	18	81	43	03	63	21	78	33	87	39
37	21	84	46	06	65	24	80	35	89	42
38	24	87	48	09	68	26	83	38	92	44
39	27	89	51	11	71	29	85	41	94	47
40	29	92	54	14	73	31	88	43	97	49
41	32	95	56	17	76	34	90	46	99	52
42	35	97	59	19	78	36	93	48	4802	54
43	37	3700	61	22	81	39	96	51	05	57
44	40	03	64	25	84	42	98	53	07	60
45	43	06	67	28	86	44	4501	56	10	63
46	49	08	70	30	89	47	03	59	12	65
47	48	11	72	33	92	50	06	61	15	67
48	51	14	75	35	94	52	09	64	17	70
49	54	16	78	38	97	55	11	66	30	72
50	56	19	80	41	4200	57	14	69	22	75
51	59	22	83	43	02	60	16	71	25	77
52	63	24	86	46	05	63	19	74	28	80
53	65	27	88	49	08	65	22	77	30	82
54	67	30	91	51	10	68	24	79	33	85
55	70	32	94	54	13	71	27	82	35	87
56	73	35	96	57	16	73	29	84	38	90
57	75	38	99	59	18	76	32	87	40	92
58	78	41	902	62	21	78	35	89	43	95
59	81	53	05	65	24	81	37	92	45	97
60	84	46	08	67	26	84	40	95	48	5000

A Table of Sines

The Degrees of the Quadrant.

M.	30	31	32	33	34	35	36	37
1	5002	5152	5302	5449	5594	5738	5880	6020
2	05	55	04	51	97	40	82	23
3	07	58	06	54	99	43	85	25
4	10	60	09	56	5601	45	87	27
5	12	63	11	58	04	48	90	30
6	15	65	14	61	06	50	92	32
7	17	68	16	63	09	52	94	34
8	20	70	19	65	11	55	96	37
9	22	73	21	68	14	57	99	39
10	25	75	24	71	16	59	5901	41
11	27	78	26	73	18	62	04	44
12	30	80	29	76	21	64	06	46
13	32	83	31	78	23	67	09	48
14	33	85	34	80	25	69	11	51
15	37	88	36	83	28	71	13	53
16	40	90	39	85	30	74	15	55
17	42	93	41	88	33	76	18	57
18	45	95	43	90	35	78	20	60
19	48	98	46	93	38	81	23	62
20	50	200	48	95	42	83	25	64
21	53	03	51	97	44	85	27	67
22	55	05	53	5500	45	88	29	69
23	58	08	56	02	47	90	32	71
24	60	10	58	05	50	93	34	74
25	63	12	61	07	52	95	39	76
26	65	15	64	09	54	97	39	78
27	68	17	66	12	57	5800	41	81
28	70	20	68	14	59	02	43	83
29	73	22	70	17	62	05	46	85
30	75	25	73	16	64	07	48	88

A Table of Sines.

The Degrees of the Quadrant.

M	30	31	32	33	34	35	36	37
31	5078	5227	5375	5522	666	809	5950	6090
32	80	30	78	24	69	12	53	92
33	83	32	80	27	71	14	55	94
34	85	39	83	29	74	16	57	97
35	88	37	85	31	76	19	60	99
36	90	40	88	34	78	21	62	101
37	93	42	90	36	81	23	64	04
38	95	45	93	39	83	26	67	06
39	98	47	95	41	85	28	69	08
40	5100	50	99	43	88	31	71	11
41	03	52	5400	46	90	33	74	13
42	05	55	02	48	93	35	76	15
43	08	57	04	51	95	38	78	17
44	10	60	07	53	97	40	81	20
45	13	62	10	56	5700	42	83	22
46	15	65	12	58	02	45	85	24
47	18	67	15	60	05	47	88	27
48	20	69	17	63	07	49	90	29
49	23	72	19	65	09	52	92	31
50	27	74	22	68	12	54	95	34
51	28	77	24	70	14	56	97	36
52	30	79	27	73	17	59	99	31
53	33	82	29	75	19	61	6002	40
54	35	84	33	77	21	64	04	43
55	38	87	34	80	24	66	06	45
56	40	89	37	82	26	68	09	47
57	43	92	39	85	29	71	11	49
58	45	94	41	87	31	73	13	52
59	48	97	44	89	33	75	16	54
60	50	99	46	92	36	78	18	56

A Table of Sines

The Degrees of the Quadrant.

M.	38	39	40	41	42	43	44	45
1	6159	6295	6430	6563	6694	6822	6949	7073
2	61	98	32	65	96	24	51	75
3	63	6300	34	67	98	26	53	77
4	66	02	37	69	6700	28	55	79
5	68	04	39	71	02	31	57	81
6	70	07	41	74	04	33	59	83
7	73	09	43	76	06	35	61	85
8	75	11	46	78	08	37	63	87
9	77	13	48	80	11	39	65	89
10	79	16	50	83	13	41	67	92
11	81	18	52	85	15	43	69	94
12	84	20	54	87	17	45	72	96
13	86	22	57	89	19	48	74	98
14	89	25	59	91	21	50	76	100
15	91	27	61	93	24	52	78	02
16	93	29	63	96	26	54	80	04
17	95	31	66	98	28	56	82	06
18	98	34	69	6600	30	58	84	08
19	6200	36	70	02	32	60	86	10
20	02	38	71	04	34	62	88	12
21	05	40	74	06	36	64	90	14
22	07	43	77	10	38	67	92	16
23	09	45	71	11	41	69	94	18
24	11	47	81	13	43	71	97	20
25	13	49	83	15	45	74	99	22
26	16	52	86	17	47	75	7001	24
27	18	54	88	19	49	77	04	26
28	20	56	93	23	52	79	05	28
29	23	58	92	24	54	81	07	30
30	25	61	94	26	56	83	09	32

A Table of Sines.

The Degrees of the Quadrant.

M	38	39	40	41	42	43	44	45
31	6227	6363	6497	6628	6758	6886	7011	7134
32	30	65	89	30	60	88	13	39
33	32	67	6501	33	62	90	15	39
34	34	70	03	35	64	92	17	41
35	36	72	05	37	66	94	19	43
36	39	74	08	39	69	96	21	45
37	41	76	10	41	71	98	23	47
38	43	79	12	44	73	6900	26	49
39	45	81	14	46	75	02	28	51
40	48	83	16	48	77	05	30	53
41	50	85	19	50	79	07	32	55
42	52	87	21	52	81	09	34	57
43	55	90	23	54	83	11	36	59
44	57	92	25	57	86	13	38	61
45	59	94	27	59	88	15	40	63
46	61	96	30	51	99	17	42	65
47	64	99	32	63	92	19	44	67
48	66	6401	34	65	94	21	46	69
49	68	03	36	67	96	23	48	71
50	70	05	39	70	99	25	50	73
51	73	08	41	72	6801	28	52	75
52	75	10	43	74	03	30	54	77
53	77	12	45	76	05	32	57	79
54	79	14	47	78	07	34	59	81
55	82	17	50	80	09	36	61	83
56	84	19	52	83	11	38	63	85
57	86	21	54	85	13	40	65	87
58	89	23	56	87	16	42	67	89
59	91	26	58	89	18	44	69	91
60	93	38	60	91	20	46	71	93

A Table of Sines

The Degrees of the Quadrant.

M.	46	47	48	49	50	51	52	53
1	7195	7315	7433	7549	7662	7773	7882	7988
2	97	17	35	51	64	75	84	90
3	99	19	37	53	66	77	85	92
4	7201	21	39	55	68	79	87	93
5	03	23	41	57	70	81	89	95
6	05	25	43	59	72	82	91	97
7	07	27	45	60	73	84	93	98
8	09	29	47	62	75	85	94	8000
9	11	31	49	64	77	88	96	02
10	13	33	51	66	79	90	98	04
11	15	35	53	68	81	91	7900	05
12	18	37	55	70	83	93	01	07
13	20	39	57	72	85	95	03	09
14	22	41	59	74	87	97	05	11
15	24	43	61	76	88	99	07	12
16	26	45	63	77	90	7801	09	14
17	28	47	64	79	92	03	10	16
18	30	49	66	81	94	04	12	18
19	32	51	68	83	96	06	14	19
20	34	53	70	85	98	08	16	21
21	36	55	72	87	7700	10	18	23
22	38	57	74	89	01	11	19	25
23	40	59	75	91	03	13	21	26
24	42	61	78	93	05	15	22	28
25	44	6	80	95	07	17	25	30
26	46	65	82	96	09	19	26	32
27	48	67	84	98	11	21	28	33
28	50	69	86	7600	12	22	30	35
29	52	71	88	03	14	24	32	37
30	54	73	90	04	16	26	33	38

A Table of Sines.

The Degrees of the Quadrant.

M	46	47	48	49	50	51	52	53
31	72 56	73 57	74 91	76 06	77 18	78 28	79 35	80 40
32	58	77	93	08	20	30	37	42
33	0	79	95	16	22	32	39	44
34	62	81	97	12	24	33	41	45
35	64	82	99	14	25	35	42	47
36	66	84	75 01	15	27	37	44	49
37	68	86	03	17	29	39	46	51
38	70	88	05	19	31	40	48	52
39	72	90	07	21	33	42	49	54
40	74	93	09	23	35	44	51	56
41	76	94	11	25	37	46	53	58
42	78	96	13	27	39	48	55	59
43	80	98	14	29	40	49	56	61
44	82	74 00	16	30	42	51	58	63
45	84	02	18	32	44	53	60	64
46	86	04	20	34	46	55	62	66
47	88	06	22	36	48	57	63	68
48	90	08	24	38	50	58	65	70
49	.92	10	26	40	51	60	67	71
50	94	12	28	42	53	62	69	73
51	96	14	30	44	55	64	70	75
52	98	16	32	45	57	66	72	76
53	73 00	18	34	47	59	67	74	78
54	01	20	36	49	49	69	76	80
55	03	22	37	51	62	71	77	82
56	05	24	39	53	64	73	79	83
57	07	26	41	55	66	75	81	85
58	09	28	43	57	68	76	83	87
59	11	29	45	58	70	78	85	88
60	13	31	47	62	71	80	86	90

A Table of Sines

The Degrees of the Quadrant.

M.	4	5	6	7	8	9	0
1	8092	8193	8293	8388	8482	8573	8662
2	94	95	94	90	83	77	63
3	95	97	95	91	85	76	65
4	97	98	97	93	87	78	66
5	99	8100	98	55	89	79	68
6	8100	01	8300	96	90	81	69
7	02	03	02	98	91	82	70
8	04	05	03	99	93	84	72
9	05	c6	05	801	94	85	73
10	07	08	07	02	96	87	75
11	09	10	08	04	97	88	76
12	11	12	10	36	99	90	78
13	12	13	11	07	8500	91	79
14	14	15	13	09	02	93	81
15	16	16	15	10	03	94	82
16	17	18	16	12	04	96	84
17	19	20	18	14	06	97	85
18	21	21	19	15	07	99	87
19	22	23	21	17	09	8600	88
20	24	25	23	18	11	02	90
21	26	26	24	20	13	03	91
22	28	28	26	21	14	05	92
23	29	30	28	23	16	06	94
24	31	31	29	24	17	07	95
25	33	33	31	26	19	08	97
26	34	35	32	28	20	10	98
27	36	36	34	29	22	12	99
28	38	38	36	31	23	13	8701
29	39	40	37	33	25	15	92
30	41	41	39	34	26	16	94

A Table of Sines.

The Degrees of the Quadrant.

M.	54	55	56	57	58	59	60
31	81.43	82.43	83.40	84.33	85.21	86.18	87.05
32	44	45	42	37	29	19	6
33	46	46	46	38	31	21	08
34	48	48	46	40	32	23	09
35	49	49	47	42	35	23	11
36	51	51	48	4	36	27	12
37	5	53	50	4	37	28	13
38	55	54	52	46	39	29	13
39	56	56	53	4	40	30	15
40	58	57	55	49	42	31	18
41	60	59	56	5	43	33	19
42	61	61	58	5	45	34	20
43	63	6	60	54	46	36	22
44	65	64	61	55	48	37	24
45	66	66	63	57	49	38	25
46	68	67	64	58	51	41	26
47	70	69	66	60	52	43	28
48	71	71	67	62	54	4	29
49	72	74	69	63	55	44	31
50	74	74	71	65	57	46	33
51	76	7	72	66	58	47	33
52	78	77	74	68	60	45	34
53	80	79	75	70	61	50	36
54	81	81	77	71	63	53	38
55	83	82	79	73	64	54	29
56	85	84	80	74	66	55	40
57	86	85	82	76	67	56	4
58	88	87	83	77	68	57	43
59	90	89	85	79	69	59	54
60	91	90	87	80	71	62	44

A Table of Sines.

The Degrees of the Quadrant.

M.	61	62	63	64	65	66	67
2	8749	8832	8913	8990	9065	9138	9207
4	52	35	15	93	68	40	09
6	55	38	18	95	70	42	12
8	58	41	21	98	73	45	14
10	60	43	23	9000	75	47	16
12	63	46	26	03	78	49	18
14	66	49	28	60	80	53	21
16	69	52	31	80	83	54	23
18	71	54	34	11	85	56	25
20	74	57	36	13	87	59	28
22	77	60	39	16	90	61	30
24	80	62	41	18	92	64	32
26	83	65	44	21	95	66	34
28	85	67	47	23	98	68	36
30	88	70	49	26	9100	71	39
32	91	73	52	28	02	73	41
34	94	75	54	31	04	75	43
36	96	78	57	33	07	77	45
38	99	80	60	36	09	80	47
40	8802	83	62	38	12	82	50
42	05	86	65	41	14	84	52
44	08	89	67	43	16	87	54
46	10	91	70	46	19	89	56
48	13	94	73	48	21	91	59
50	16	97	75	51	23	94	61
52	19	99	78	54	26	96	63
54	21	8902	80	56	28	98	65
56	24	05	83	58	31	9200	67
58	27	07	85	61	33	03	70
60	30	10	88	63	35	05	72

A Table of Sines.

The Degrees of the Quadrant.

M.	68	69	70	71	72	73	74
29	274	9338	9399	9457	9512	9565	9614
4	76	40	9401	59	14	66	16
6	78	42	03	61	16	68	17
8	80	44	05	63	18	70	19
10	83	46	07	65	19	71	20
12	85	48	09	66	21	73	32
14	87	51	11	68	23	75	24
16	89	53	13	70	25	76	35
18	91	54	15	72	27	78	27
20	93	56	17	74	28	80	28
22	96	58	39	76	30	81	30
24	98	60	20	78	32	83	32
26	9300	63	22	80	34	85	33
28	02	65	24	81	35	85	35
30	04	67	26	83	37	88	36
32	06	69	28	85	39	90	38
34	08	71	30	87	40	91	39
36	10	73	32	89	42	93	41
38	13	75	34	91	44	95	42
40	15	77	36	92	46	96	44
42	17	79	38	94	48	98	45
44	19	81	40	96	49	9500	47
45	21	83	42	98	51	01	48
48	23	85	44	9500	53	03	50
50	25	87	46	01	54	04	51
52	27	89	47	03	56	06	53
54	29	91	49	05	58	08	55
56	32	93	51	07	59	09	56
58	34	95	53	09	61	11	58
60	36	97	55	10	63	13	59

A Table of Sines.

The Degrees of the Quadrant.

M.	75	76	77	78	79	80	81	82
5	9663	9706	9747	9784	9819	9850	9879	9905
10	67	10	50	87	22	53	81	07
15	79	13	53	90	24	55	84	09
20	74	17	56	93	27	58	86	11
25	78	20	60	96	30	60	88	12
30	81	24	63	99	32	63	90	14
35	85	27	66	9802	35	65	92	16
40	89	30	69	05	38	68	64	18
45	92	34	72	08	40	70	96	20
50	96	37	75	11	43	72	98	22
55	99	40	78	13	46	74	9900	24
60	9703	44	81	16	48	77	03	25

The Degrees of the Quadrant.

The Sca-mans Kalender.

The Extraction of Rootes.

IT is not unecessary, before we do enter into this order and method of teaching how to extract a Root to shew the divers kinds and their definitions: Wherefore you must know that of Rootes there are sundry sorts, according to the quantities from which they are deuided, as the Squares, Cubes, Squared squares, Surd-solides, &c. for the numbers receive their names of the said quantites, every quantity having his Roote, which may be called the first quantity. Because it is the side or beginning of the quantity whereunto it is set: Numbers of the second quantity are called squares of the third Cubes, of the fourth squared squares as before: wherein you may proceede infinitely if you will, but you shall seldom euer haue use for the extractions of the Roote of any quantity moare then Squares and Cubes: A Square number is the Product of any number multiplyed in it selfe, and the Roote thereof is the multiplier whereby the same square number is produced: As for example, 4. is a square number comming of the multiplication of 2. in it selfe which is the Roote thereof.

A Cubick number is the product of any number multiplied into it selfe, and the same product multiplyed againe by the first number: As 2. multiplyed by it selfe, is 4. that Product multiplyed againe by 2. the first number makes 8. which is a Cubick number, and the Roote thereof.

A Squared square number, is produced of 3. multiplications, first any number by it selfe makes a square number, that product againe, by the first roote or multiplier, makes a Cubick number: and lastly, that product againe by the first figure or rate, produceth a squared square number, as 2. multiplyed in it selfe makes 4. a square number, that againe by 2. makes 8. which is a Cubicke number, and then that product againe by 2. produceth 16. which is a squared square number: and the roote thereof is 2. A Surd-solid number is the product of a number multiplyed 4. times by the roote thereof: as 1 2. is a surd-solid number, the number whereof is 2. for 2 multiplyed in it selfe is 4. that multiplyed againe by 2. is 8. the same product againe by 2. makes 16: and lastly, the same product multiplyed by the first number 2. makes 32. there-

The Sea-mans Kalender.

soze I conclude that 32. is a surd solide number, and the number 2. whereby the sayd number is produced, is the surd solide roote to the sayd number: And thus multiplying the last product by the first number oþ roote, you may proceede infinitely, but more then these are needless, and as I said before, without any great oþ common vse.

Now for the finding of the roote, it must bee done according to the quantitie whereof it taketh Domination, as whither it be of a Square oþ Cube, oþ otherwise: which knowne, let vs procede to the working thereof.

You must understand that the order of extracting the roote of any quantitie, is not much unlike to Division, differing onely in this, that whereas in Division the devisor is knowne, but heere it is to finde: also in Division you alwayes kepe one divisor, but in this, you must change your divisor at each remouing, which is at the finding of every figure contained in the roote: Now therefore, I will lay downe one generall way for the extraction of the roote of all quantities whatsoever, which is done by certaine numbers applyed to each severall quantity: which are these: For the Square roote in one number required, which is 20. for the Cube two numbers, which are 300. and 30. For the Squared Square, three numbers, viz. 4000. 600. and 40.

Thus having declared the kindes, numbers, quantities, and order of the extraction of all sorts of rootes, it followeth, that wee procede to the practice thereof: And first, to extract the Square roote of any number, you must consider as before I haue sayd, that 20. is the number for the same quantitie: Also you must learne by memory the iust Square of all the 9. unities, which if you know not, this Table will stand in some stead: where you see that 1 1
against every of the 9. unities aforesayd, towards the right 2 4
hand, is the Square of that unity against which it doth 3 9
stand: which knowne, set downe the number whereof you 4 16
would extract the Square roote, then vnder the last figure at 5 25
the right hand, putt a prick, & then proceeding towards the 6 36
left hand vnder every second figure putt a prick, that done, 7 49
draw with your pen a quotient as in diuision: Now for to 8 64
finde the roote of your giuen number, seeke the greatest 9 81
Square

The Seamans-Kalender.

Square number contained in the number ouer the first pricke, that Square number take from the number ouer the said first pricke, and set the remayner ouer it, the roote of which Square number put in the quotient for the first figure of the roote: that roote multiply by 20. the number for the Square roote: and then looke how often the product thereof may be taken from the number ouer, or so the left hand of the second pricke, which put in your quotient for the second figure of your roote: but this is to be noted for a generall rule, that you must take no greater number for your second figure, then that the Square thereof added with the former product, may bee taken from the number ouer the said second pricke: and also looke how many prickes are vnder your giuen number, so many figures must be in the quotient for the roote of the said number: Then having found 2. figures in the quotient, if there bee any more prickes, multiply the whole number in the quotient by 20. and seeke how often the product thereof may be taken from the number ouer, or belonging to the next pricke; which number put in the quocient, and adding the Square thereof to the former product, subtract the whole summe from the number ouer the said pricke, and cancelling the said number as at each remoue you must doe, set the remayner ouer it, and if there be any more prickes vndone, doe as you did before, always multiplying the quotient by 20. thereto adding the Square of the last figure, and the totall summe being substracted from the last remayner, if there rest nothing, it is a Square number or else not, which you may prove if you multiply the roote by it selfe squarely, for the roote being truly extracted, will produce the first giuen number. But because that examples are easiest for the vnderstanding, let 104976, bee the giuen number whereof I would know the Square roote, viz. What number being multiplied into it selfe, will produce the aforesaid number of 104976. Therefore first I set downe the said number, and vnder the last figure towards the right hand, which in this example is 6. I put a pricke or point, another vnder the 9. and lastly another vnder 0. leauing one figure betwixt every pricke, which done and the quotient drawne, the giuen number will stand thus: 104976.1 — whereby I see that the roote of the said number must consist of 3. figures because it hath 3. prickes vnder it: then I shall

The Sea-mans Kalender.

the greatest Square number is 10. it being the number belonging to the first pricke toward the left hand, that I finde to be 9. which is produced of 3. multiplied squarely, therefore I put 3. in the quotient for the first figure of the roote, and the Square thereof being 9. I subtract from 10. the number ouer the first pricke, and there rests 1. The order of which worke will stand thus :
 where you see that the figures ouer the first pricke ~~104976~~ 13
 cancelled, there is 3. in the quotient for the first figure of the roote and 1. rest, which with the figures
 betwixt it and the next pricke, makes 149. for the number of the
 second pricke. Now for the second figure of the roote, I multiply
 3. the roote already found by 20. and the product is 60. that I seeke
 how often I may take from 149. the number ouer the second pricke
 which I may doe 2. times, for 2. times 60. is 120. wherunto the
 square of 2. which is 4. being added, makes 124. that subtracted
 from 149. leaues 25. therfore I put 2. in the quotient for the second figure of the roote, and cancel-
 ling the figures ouer the second pricke, the remay-
 ner being put ouer it, the working thereof will
 stand in this order : where you see the quotient is
 23. for the two first figures of the roote, and the
 figures of the two first prickes being cancelled,
 ther rests 25. which with the other figures be-
 twixt them and the third and last pricke, makes
 2576. for the number ouer the last pricke : now
 therfore, to finde the last figure of the roote, I
 multiply the roote already found, that is to say,
 32. 20. and the product thereof is 640. that I
 seeke how often it may be taken out of 2576. the
 number ouer the last pricke, which may be done 4.
 times, for 4. times 640. is 2560. wherunto if I
 adde the square of 4. there will amount 2576.
 which because it may be taken from the number
 remayning ouer the last pricke, I put 4. in the
 quotient for the last figure of the roote, and sub-
 tracting the former product of 2576. from the
 number ouer the last pricke, which is likewise

$$\begin{array}{r}
 104976 \\
 - 9 \\
 \hline
 124 \\
 - 120 \\
 \hline
 4 \\
 - 4 \\
 \hline
 0 \\
 - 3 \\
 \hline
 60 \\
 - 60 \\
 \hline
 0 \\
 - 2 \\
 \hline
 2 \\
 - 2 \\
 \hline
 0 \\
 - 4 \\
 \hline
 4 \\
 - 4 \\
 \hline
 0 \\
 - 24 \\
 \hline
 5276 \\
 - 4849 \\
 \hline
 4276 \\
 - 4096 \\
 \hline
 180 \\
 - 160 \\
 \hline
 20 \\
 - 20 \\
 \hline
 0
 \end{array}$$

3576. there

The Sea-mans Kalender.

2576. there will rest nothing, therefore I cancell
these figures likewise. and thereby conclude
104976. to be a square number, and 324. to be
the roote thereof ; the ymse whereof is by multi-
plying the roote into it selfe squarely : so if you
multiply 324. by 324. the first given number of
104976. will be produced, the working thereof
will be as above you may see,

This example in my minde, might be sufficient with often vse and practice to bring perfecti-
on in this kind of Extractions, because that al-
though the summe be never so great, , it is done
all by one manner of wozke, yet neuerthelesse, if
I did not thinke, that thou wouldest complaine
rather of tediousnes of learning, then of the diffi-
culty in teaching , I would give another exam-
ple : for varietis of examples makes the wozke
seeme the moxe easie , Therefore once againe : let 548730625.
be a givien number , whereof I would know the Square roote ,
first I put prickes or points vnder the givien number in such or-
der as you see , beginning at the last figure towards the right
hand , and proceeding towards the left , leaving one figure un-
pointed betwixt every pricke , where you see that the whole givien
number consist of 5. prickes , therefore of so many figures must
your roote or quotient be : then drawing a quotient , I seeke the
greatest square number in 5. which is the number ouer the first
pricke , which greatest square number I finde to be 4. and the root
thereof 2. for two times 2. is four, therefore I put 2. in the quo-
tient , and taking 4.the square thereof from 5. the number ouer the
first pricke , there will rest 1. which I set ouer 5. & vncelling the said
5. the working whereof will stand as a. 1
against : then for the second figure of the 548730625. | 2.
roote I multiply 2.the first figure of the 4
roote already found by 20. and the pro-
duct is 40. that I seeke how often may bee taken from 148. the
number remaining ouer the second pricke , which may be done 3.
times, for three times 40. is 120. whereto the square of 3. being

The Sea-mans Kalender.

added makes 129. then I put 3. in the quotient for the second figure of the roote, and subtracting 129. the last product from 148. the number remaining ouer the second prick, there will rest, 19. which with the other figures betwixt them and the next prick, makes 1973. therfore I can tell the 148. and setting the remainder ouer it, I haue 1973. for the number ouer the third prick, & 23. in the quotient for the 2. fist figures of the root: now for the third figure of the root: I multiply 23. the roote already found by 20. the product is 460. which may be taken from 1983. the number remaining ouer the third prick 4. times for 460. multiplied by 4. makes 1740. whereunto adding 16. the square of 4. the product is 1856. therfore I put 4. in the quotient for the 3. figures of the root, and subtracting 1856. from 1973. the number ouer the third prick, there will remaine 117. which with the other figures betwixt them and the next prick, makes 11706. for the number over the fourth prick, and there is in the quotient 234. for the roote already found the whole wozke standing as aboue: A. 1856
gaine, for to finde the fourth figure of the root, I multiply 234. the roote found. by 20. the product wherof is 4680. which may be taken out of 11706. two times, for 4680. multiplied by 2. makes 9360. which with 4. the square of 2. make in all 9364. the same being subtracted from 11706 the number remaining over the fourth prick, there will rest 2342. which with the other figure betwixt them and the fist and last prick, makes 234225. for the number remaining ouer the last prick, therfore making my subtraction. I set the remainder ouer it, and put 2. in the quotient for the fourth figure of the roote, as you may see in the margin: then to finde the last figure of the root of this given number aforesaid, I multiply the whole roote alreadie found, viz. 2342. by 20. the product is 46840. which may be taken from 9364. 234225. the

The Sea-mans Kalender.

234235. the number ouer the last prick 5. times, for 46840. multiplied by 5. makes 234200. whereunto if I adde 25. the Square of 5. the whole product will be 234225. which number is equall to the number ouer the last prick, thereto I put 5. in the quotient, for the last figure of the roote, and subtracting the whole summe of the last prouid, viz. 234235. from the number ouer the last point of prick, which is likewise 234225. there will remaine nothing, whereby I finde 548730625. the giuen number to be a Square number, and the roote therfore to bee 23425. which is the number found out in the quotient, as in the working thereof you may more plainly perceiue.

For profe whereof, if you multiply 23425. the root squarely into it selfe, the product thereof will be equall to the first giuen number.

I doubt not but to any indifferent conceite, these two examples will suffice as well as if I should contrive a whole volume thereof when it is so that the giuen number is a right Square number, but if the giuen number be not a Square number it is vnpossible for to finde an exact roote thereto, but that after the worke there will remaine something as a fraction or part of a number more to be added to the quotient: for the true and perfect valuation of which fraction or remainder, none as yet could attaine, but they haue set downe so nere a way for the extraction of the roote of any number not being a Square number, that thereby no great errore may be perceiued. For the knowledge and better vnderstanding of which let this be a familiar example: you know that 16. is a right Square number, and the Square root thereof is 4. but if you would extract the Square roote of 18. you shold haue 4. in your quotient likewise for the root thereof, but then there will rest 2. whereby you see that 18. is no Square number, neither can you know what fraction to make of it, by reason that you haue no certaine devisor whiche might stand for Denominator to the Numerator or remainder: onely let this suffice, that to finde the nearest root thereof, the rule is thus: double the remainder for the Numerator and quadruple; viz. multiply the roote by 4. and thereto add 1. for the Denominator to the said Numerator as in this example, to extract the nearest Square roote of 18. I finde 4. to bee

$$\begin{array}{r} 18 | 4 \frac{1}{16} \\ -16 \\ \hline 2 \end{array}$$

The Sea-mans Kalender.

in the quotient, and 2. remaining, which 2. being doubled makes 4. soz the Numerator, and 4. the roots being multiplied by 4. makes 16. and 1. added therewith, makes 17. soz Denominator, whereby I say that $4\frac{1}{2}$ is the nearest Square roote of 18. which may bee found out, soz if you reduce $\frac{1}{2}$. into one common Denomination, and then multiply them squarely, the product will be 17. $\frac{1}{2}$. which is but $\frac{1}{12}$. to little.

Thus having declared the order how to extract the Square root of any number : It resteth now that I shew the manner of extracting the Cube roote of any number: as soz the principall uses thereof, you shall find in the generall practise of the Mathematickes.

To finde out the Cube roote of any giuen number, being a right Cube number, first put downe the giuen number, and as in the square number you put points or prickes : beginning at the right hand and so towards the left, leauing betwixt each point one figure boide, so in the extraction of the roote of a Cube number, you must leauue two figures boide or wippickt betwixt every point, and as in the Square roote, so likewise in this : looke how many points are vnder the giuen number, so many figures must be contained in the roote thereof, which is also to bee obserued in extracting the roote of any quantity whatsoever : these things being consider'd, it is also necessary, that you know the greatest Cubick number of every of the 9. unities, whereof the Table herewnder specifies maketh explanation : where you see that against each unity standeth the Cube number thereof, which being knowne, and the giuen number prickt, 1 1
with a quotient drawne as before I haue 2 8
shewed : to extract the Cube roote, you haue 3 27
2. numbers, viz. 300. and 30. but because the 4 64
working therof would be too long to expresse 5 125
in termes let 13824. be a giuen number, 6 216
whereof I would extract the Cube roote. 7 343

First I put downe that number aforesaid 8 512
with points vnder it, & a quotient in this or 9 729
over, 13824. whereby I see that the root thereroft
must consist of two figures, because so many points doe belong
vnto the giuen number : soz the first figure whereof I seeke
the

The Sea-mans Kalender.

the greatest Cube number contained in 13. the number over the first point towards the left hand, which I finde to bee 8. the Cube roote thereof, which is 2. I put in the quotient for the first figure of the roote and subtracting 8. from 13. rest 5. which I put ouer 13. cancelling the sayd 13. which done, the wozke will be as below.

Now soz to finde the second figure

of the roote, I set dolvne the 2. numbers
which serueth for the extraction of the

Cube roots, viz. 300. 30. and against

30. I put the roote already found,

which is 2. and against 300. the Square

thereof, which is 4. these two figures I

set towards the left hand of them, then

I multiply 300. by 4. the figure which

standeth against it, and the product is

1200. that I seeke how often I may

take from 5824. the number over the

second pricke, which I may doe four

times, therefore I put 4. in the quoti-

ent for the second figure, and vpon the

right hand against 300. I set 4. the last

found number in the quotient, and a-

gainst 30. I put 16. the Square thereof:

and vnderneath 30. I put 64. which

is the Cube of 4. then multiplying all

the figures which are in a row into one

product, viz. 4. by 300. makes 1200.

and that againe by 4. makes 4800.

for that product: then for the next, 2. by 30. makes 60, and that

by 16. makes 960. for the second product, which I set dolvne to-

gether each vnder other. Lastly, because 64. hath no other num-

ber to be multiplied therewith, I put that dolvne vnder them,

which done, I adde them altogether, and the totall summe is 5824.

the same subtracted from the number over [the last pricke], leaueth

nothing, whereby I see that 13824. is a Cubicke number, and the

Cube roote therefoze is 24. as you may more

plainely see by the working thereof, which is

put in the marginne above, where you see that

$\times 3824$	$ 2$
8	
62	300
60	4
6	1200
4	4
4800	
360	
60	
960	4800
960	960
64	
	5824.
$\times 3824$	$ 24$
8	
24, being	

The Sea-mans Kalender.

24. being multiplied into it selfe, and that product againe by 24. the first multiplier, the product is 13824. which is equall to the first given number.

Againe, seeing that examples are the easest Method of teaching and plainest for understanding: let 12551868224. be a given number: whereof I would extract the Cube roote. First having prickt it and drawne a Quicke for the roote, thus 12551868224. I see that the roote must consist of 4. figures, so many prickes being vnder the given number. For the finding of which figures, I seeke first the greatest Cube number in 12. which is 8. the root whereof being 2. I put in the quotient, for the first figure of the roote, subtracting 8. 4 the Cube thereof, from 12. the number ouer the first pricke, rest 4. then for the second figure of the roote, I put downe 300. and 30. the numbers for the Cube root against 30. I set 2. the roote found: and against 300. 4. the Square 4 300 3 thereof: and multiplying 300. by 4 the Product 2 30 9 is 1200. that may be taken out of 4551. the number ouer the second pricke, 3. times, therefore I put 3. in the Quotient, and likewise after 300. and the Square thereof which is 9. after 20. and the Cube thereof which is 27. I put vnder 30. then I multiply all the numbers in the first row, each by the other, viz. 4. by 300. makes 1200. and the same Product againe by 3. makes 3600. which I set by it selfe: Then againe I multiply 2. by 30. is 60. and that againe by 9. makes 540. which I put vnder the other Product. Lastly, because 27. hath no number wherewith to be multiplied, I set downe likewise vnder both the other, 540. and the 3. numbers being set in order one vnder another, 27. as you see, I adde them altogether, and the whole product is 4167. the same I subtract from 4551. the number ouer the next Prick, 4167. and there will remaine 384. to ioyne with the number

5824	24
	24
	—
	96
	48
	—
	576
	576
	—
	24
	—
2304	
1152	—
	13824

~~12551868224~~ | 23

8

4 300 3

2 30 9

27

540

27

4167

ber

The Sea-mans Kalender.

ver ouer the 3. pricke : which done, the worke will stand in this order as you see.

Now for the third figure of the roote I put 4284
downe 3000. and 30. as before, and against 12551868224123
30. at the left hand, I put 13. the roote al- 8 . . .
ready found, and against 300. the Square
thereof, which is 529. then multiplying 529. 4167
by 300. the Product is 158700. which may 529 300
be twice taken from 384868. therefore I 23 30
put 2. in the Quotient for the thrid figure of the roote and likewise
put 2. to the right hand of 300. and the square thereof which is 4. at
the right hand of 30. and the Cube thereof being 8. I put vnder 30.
which numbers will stand as aboue; then multiplying all the num-
bers in one row each by other, into one Product, viz. 529. by 300.
makes 158700. and that againe by 2. is 317400. for the whole
Product of that rowe, which I set downe by it selfe; then I multi-
ply 23. by 30. is 690. and that againe by 4. is 2760. for the Pro-
duct of the second row.

Lastly, because 8. hath no number with
it, I put it downe vnder the other, and
then adding all the three summes toge-
ther, the product is 320168. the same ta-
ken from 384868. the number ouer
the thrid pricke, refts for the number
ouer th: last pricke, 64700224. and in the
Quotient, is 232. the whole worke being
as you see aboue.

Now to find the fourth and last figure of the roote, I put downe
the two numbers againe which serue for the Cube roote, viz. 300.
and 30. At the left hand of 30. I put 232. the numbers in the quo-
tient, and at the left hand of 300. I set this square of 232. which is
53824. in this order. Then multiplying 53824. by the pro- 53824.
duct, is 16147200. which I seeke how often may bee had 232,
in 64700224. the numbers remayning ouer the last pricke, that
may be doun 4. times: Therefore, I put 4. in the quotient, for the
fourth and last figure of the roote, and also I set the sayd 4. at the
right

The Sea-mans Kalender.

right hand of 300. and the Square thereof which 53824. " 300. " 4.
is 16. at the right hand of 30. and the Cube 232. " 30. " 16.
thereof being 64. I put right underneath 30. 16. 64.
which done, all the numbers will stand as aboue: Then multiplying
all the numbers in each row, into their seuerall products, viz.
53824. by 300. makes 16147200. that againe by 4. is 6458800
which I set by it selfe: Then againe, 232. by 30. is 6960. the same
Product by 16. makes 111360. which I put downe vnder the
other.

Lastly, because 64. hath no other number to be multiplied therewith, I put it downe likewise, vnder the other two numbers, and adding the threæ products together, the whole summe thereof will be 64700224. which being subtracted from the number remayning ouer the last prioks, leaues nothing: So haue I in the Quotient
2324. for the Cube root of 12551868224. the giuen number: the
whole worke wherof, is here set downe in the Margine. For the
profe wherof if you will multiply the roote: viz. 2324. Cubickly
in it selfe, the Product thereof will be equall with the first giuen
number, as for example you may see in the working.

Where you see, that 2324. the roote being multiplied into it
selfe Squarely, and then likewise the inhole product thereof againe
by the same roote, 2324. The totall summe amounting thereof,
12551868224. is the first giuen number.

But when you haue a number giuen to ev. 12551868224.,
tract the Cube roote, and the foresaid giuen number be not a right
Cube number, whereby you canoþ come to any perfect roote thereof,
but that there will remayne some fraction or broken number after
your said extraction, onely the manner to extract the neareſt roote of
a number not Cubical, as most writers doe affirme, is thus:

The difference betwixt the Cubicke number of the roote, and
the Cubicke number of a number moþe then the roote, by an unitie
shalbe the Denominator to the remainder, 1. added also thereto:

As for example: Let 12. be a number giuen, which not being
a right Cube number, I would finde the neareſt roote thereof: firſt
the greatest Cubick number in 12. is 8. the Cube roote whereof
being 2. I put in the quotient, and subtracting 8. the Cube thereof
from

The Sea-mans Kalender.

from 12. there will rest 4. which 4. being ouer, sheweth y 12. is no Cubick number; therefore adding 1. to 4. makes 5. which I put for the Numerator: and to find the Dominator thereto, I set downe the Cube 2. the root found, which is 8. and likewise a 7. the Cube of 3. which is a number moare then the root by 1. then subtracting the one from the other, viz. 8. from 27. leaues 19. for the Dominator: By which reason the nearest Cubick root of 12. is 1. which being reduced, and multipliyed Cubickly, makes 11. $\frac{1}{3}$. the same abridged, makes 11. and very neare $\frac{1}{3}$ and it should be 12. therefore the error is $\frac{1}{3}$. too little, which although in this is no great errore, yet in a great summe the errore wold be very much: Therefore for those which desir a more exact & perfect extraction of the square or Cube roote from numbers not being right square or Cubick numbers: Master Record in his Whetstone of wit, setteth downe an exact way (but being tedious) which is thus: For the square roote, adde to the giuen number so many times 2. Ciphers, as you desire the neerenesse of the roote: And for the Cubick root so many times 3. Ciphers, as you desire the exactnesse of the root thereof: and vnder the said Ciphers, put prickes in such order as before is taught: and then marke how many prickes there is ouer and besides the prickes of the giuen number: and then extract the root from all those Ciphers in such order as you did before: for if there be 1. moare the root shall bee tenths and the remainder parts of $\frac{1}{10}$. if there be two points or prickes ouer, moare then the giuen number, then the root shall be hundreths; and the remainder parts of $\frac{1}{100}$. if 3. prickes be ouer, the root shall be thousands and the remainder parts of $\frac{1}{1000}$: and so you may come to a very neare roote, but not to any exact or perfect roote, vnlesse the giuen number be a right square or Cubicall number.

A Declaration of the Tables of Longitude and Latitude of places following.

The Tables hereafter following shewing the Longit. and Lat. of places, viz. of Kingdomes, Provinces, Cities, Iles, Capes, Bayes, Riuers, and Mountaines, especially the most principall of them:

The Sea-mans Kalender.

them in the whole world, are gathered from the latest Descriptions, Maps & Charts, as well uniuersall as particular: wher albeit they differ greatly in Longitude, yet in Latitude most of them agree: and also haing a respect to the beginning of each of their severall Longitudes, they come all to a neare agreement: For some beginning their Longitude at the Westermost part of Africa, makes the Longitude of London to be about 10. degrees 20. minutes: others beginning at the Canary Islands, makes the Longitude of London 18. degrees: others more Westward, make it 19. degrees 30. min. and so Iocas Hondius beginning the Meridian at the Isle Pico, one of the Azores, makes London to be in Longitude 17. deg 40. min. but I following M. Emery Molineux, according to his great Globes, doe account the Longitude from the Westermost parts of St. Michaels, another Isle of the Azores, the midst of which Isle is 50. min. in Longitude, and from the Westermost part thereof the Longit. of London is 25. deg. 40. min. which in effect is not much different from any of the others: Note that the Longitude is counted from the Meridian passing over the aforesaid place Eastwards into a continual progression, to the end of 360. which is the whole Circumference of the world. Latitude is counted from the Equinociall to the end of 90. deg. on each side thereof: and where the letter S. is after any number, it shewes the place to haue so many degrees and minutes of South Latitude, all the rest having no letter adioyning, haue North Latit. the whole being set in Alphabeticall order for the readier finding of any place therein contained: and where the Longitude and Latitude of any Land or Ile is set downe, noted by this sillable Rex, it expresseth the middle thereof. Further at the end of such places as begin with one letter, is left a space wherein the Traueller may insert such places, wherof the Longitude and Latitude is to him knowne, and not herein expressed.

A Table

A Table of the Longitude and Latitude
of all the Notable places of the
World.

A	Longit.	Latit.	A	Longit.	Latit.
A			Alicoá	7 41	13 21
Cupulco	270 1 18 1		Alicur	44 31	38 29
Acartij an Il.	329 1 52 1		Alima	108 51	31 1
Azores an lland	357 1 39 1		Alleluia	70 21	10 1
Achaguas	101 30 5 30 S		Almedina	34 1	33 41
Achin	132 30 4 40		Alpes a mountain	41 29	47 29
Aden	81 12 13 1 S		Alfigubas	147 11	38 41
Adia	50 11 25 1 S		Amazon	45 29	12 41
Adu	105 41 5 41		Amazons Reg.	32 3	1 13 1
Ægypt	64 3 30 1		Las Amazona	312 29	13 29
Africa Reg.	40 1 10 1		Ammon	59 41	27 11
Agonata	162 21 38 1		Amsterdam	33 1	51 29
Aragam	144 29 8 21 S		Auerie a mount	116 0	54 9
Aguada segura	253 29 24 1		Ancona	63 11	1 11
Aqua la de pozos	245 20 38 0		Ancona	43 39	43 51
Alina a mountain	98 41 54 20		Amboina	161 54	3 20
Alacranes	283 5 22 1 S		Abona	164 30	6 10 S
Alagoa	58 41 19 41 S		Amiona	75 20	12 40 S
Albion noua	235 1 50 0		Andernopoly	58 11	44 41
Albiron	109 29 25 29		S. Andre	170 29	12 1
Alboram	25 29 35 29		S. Andre	22 11	56 21
Albrough	26 25 52 20		S. Andrcas	62 11	61 11
Alepo	72 29 38 1		Las a negadas	296 0	50 1 S
Alcada	23 4 40 29		Angier	24 41	47 35
Alexandria	65 1 31 21		Anglesey	19 51	54 0
Alexandria	73 11 36 21		Anglia Reg.	23 0	53 0
Algaziu	16 0 29 1		Angolesme	27 1	46 0
Algiero	33 1 35 21		Antiochia	300 5	6 40
Alguescet	63 41 26 51		Antipara	74 2	25 20 S
Alicante	28 41 39 1		Antwerpen	31 20	50 30

A.B	Longit. Latit.	B	Longit	Latit.
Arabia felix	83 0 21 0	Balsera	82 4	31 10
Arabia desart	77 0 30 0	Bamberg	39 15	50 10
Armenia Reg.	76 0 41 0	Bandu	173 30	33 0
Amoltus mount	35 0 11 30 S	Bax delos pergos	345 30	20 0 S
Asention	353 20 18 50 S	La Barbada	193 50	1 50 S
La ascension	15 30 8 0 S	Barlingas	16 20	39 30
Afria Reg.	85 0 36 0	Barnagossos Reg.	70 0 13 0	
Athens	56 10 40 0	S. Bartholome	194 30	14 0
Auero	17 30 41 10	Basell	37 10	47 50
Augustine	293 0 29 50	Beciasa	65 0 10	30
Ausbourg	38 40 48 30	Beil	76 15	27 10
Azura a mountain	59 0 22 40	Belef	69 0 51	40
Amiens	28 30 49 40	Belisse	21 30	47 0
B				
B Antam	140 0 5 40 S	Bengala Reg.	126 0 26	30
Babylon	82 20 33 0	Benichao	136 0	3 50
Babell mandell	80 0 12 50	Benin Reg.	41 0	7 40
Bachu	88 50 42 0	Bepirus a mount	143 0 34	0
Bactriana Reg.	115 0 38 30	Bepirus a Riuer	138 20	34 0
Bagasus a lake	77 10 50 40	Berga	40 10	62 50
Baharaman Ile	87 20 27 30	Bergeh	30 30	60 50
Bayes		Barwick	22 50	55 50
Bay anegada	319 50 40 20 S	Bethle	38 50	25 40
Bay debaxos anegados	321 30 39 50 S	Baifer Reg.	50 0	4 0
Bianza	149 25 3 0 S	Braligrod	58 20	47 30
Batauia	123 0 3 20 S	Bilbao	23 30	43 0
Bay a dalagoa	56 10 32 10 S	Blaskey	12 0	51 40
Bay de fumos	240 20 36	Blaues	31 10	42 0
Bay de S. Migell	39 30 8 40	Blauet	21 15	47 50
Bay oçsinora	312 30 41 0	Bloe	5 30	67 0
Bay de plinos	233 0 14 30	Borneo	131 30	5 10
Bay y langos	18 0 37 30	Borntholm	40 50	55 30
Bacalaio	335 4 48 28	Souenbergen	34 20	16 30
Bayona	17 20 42 10	Brandenberg	42 30	52 50
Bayone	25 30 44 0	Brasil	5 10	51 20
		Braflia Reg.	345 0 10	0 S

B C	Longit. Latit.	C	Longit. Latit.
Braua	74 30 0 30	Cap braua	275 1 27 29
Brest	20 0 48 30	Cap de breton	331 1 45 41
Bruage	25 30 45 50	Cap cameron	287 21 25 41
Bruges	29 0 51 10	Cap comerin	115 15 7 30
Buda	48 0 47 20	Cap Cantin	17 1 32 11
Burdiaux	26 0 45 10	Cap de S. Cather.	41 1 1 1
Bristowe	22 50 51 35	Cap de cro	31 29 43 11
Brachipult point in Wales	21 25 53 0	Cap croce	65 21 48 21
Bachapto	31 0 59 50	Cap de fierto	281 21 29 21
Brussels	30 50 51 0	Cap de sperance	324 29 51 1
Barcelona	28 15 41 10	Cap des domingo	315 21 46 41
Burlings	16 0 39 38	Cap falso	41 31 34 40
C		Cap feare	305 11 32 29
Capes		Cap felix	84 29 14 11
Ape S. Francis	335 0 48 5	Cap finis terre	16 1 43 11
Cape Raso	334 40 46 28	Cap Florida	293 21 25 29
Cape Massifaco	24 0 43 32	Cap formoso	28 1 5 1
Cape de las penes	21 0 43 35	Cap froward	302 39 53 21
Cape de Alinde	346 50 1 0	Cap de gato	26 39 36 51
Cap de Amber	85 30 12 0	Cap de S. Helena	326 11 36 11
Cap de S. Anton	289 15 22 50	Cap de santiago	309 1 37 29
Cap Cleare	14 10 51 9	Cap S. John	62 29 67 29
Cap de S. Antoni	74 30 17 0	Cap de Krin	13 1 53 41
Cap de S. August	162 0 6 30	Cap de S. Maria	77 29 24 1
Cap de S. August	354 0 8 30	Cap de Maio	82 52 15 51
Cap baxo	328 0 4 20	Cap de S. Maria	327 11 35 11
Cap de las bixas	19 41 15 29	Cap de S. Maria	9 41 21 41
Cap Bedford	320 1 65 29	Cap de la Mola	36 51 6 29
Cap blanco	273 19 25 21	Cap de nombre de	308 11 53 1
Cap blanco	281 19 10 29	Iesus	S
Cap blanco	331 21 4 26	Cap ortegall	18 29 44 11
Cap blanco	334 21 52 1	Cap de palmas	348 11 1 19
Cap blanco	289 41 2 21	Cap de S. Paul	32 0 5 50
Cap blanco	151 1 22 41	Cap de pescadores	277 40 28 0
		Cap del plate	352 50 5 0
		Cap primero	42 30 2 20

C	Longit.	Latit.	C	Longit.	Latit.
Cap de 3. points	28 30 55 20		Casma a riuer	121 40 61 0	
Cap de puntas	315 20 10 40		Castrum portugal	57 10 20 20	S
Cap daduillius	42 1 34 30		Cazan	86 20 56 30	
Cap de Razo	334 30 46 20		Chaga	56 0 6 20	S
Cap salida	74 0 26 10 S		Chialo	56 20 7 0	S
Cap despigiel	353 20 7 20 S		Chilimazata	194 30 6 30	S
Cap de stauola	12 20 54 0		Chio	58 30 40 30	
Cap Torriga	11 3 18 20		Chiguisamba	305 30 17 0	S
Cap la vela	305 1 51 50		Coale	65 0 21 30	
Cap S. Vincent	302 20 53 40		Coila	48 20 3 10	S
Cap de Virgin M.	308 0 52 10 S		Cora	85 10 49 20	
Cap devittoria	297 30 52 0 S		Coronades	296 30 45 0	S
Cap passaro	46 29 36 51 S		Corpo santo	84 10 7 30	S
Cap refalgate	96 21 22 21		Cumana	313 30 7 0	
Cap raflo	217 41 8 0		Cusco Reg.	297 20 13 30	S
Cap roxent	16 29 18 51		Cales in Spaine	20 51 36 10	
Cap roxo	11 112 0 S		Cambalu	161 11 51 40	
Cap of good hope	39 29 34 40		Canada	305 11 50 2	
Cap del spirito sa	161 11 13 11		Canaria	9 29 27 21	S
Cap S. Vincent	17 0 37 0		Canda	59 29 35 21	
Cap Verd	9 51 14 20		Caribes	316 11 7 0	
Cap de bona vesta	334 21 49 11		Cartagena	300 1 11 20	
Cap Walsingham	321 1 63 41		Cartagena	28 21 38 20	
Campon Reg.	136 1 47 0		Cartago	299 29 3 11	
Cairo	67 29 30 0		Casena Reg.	38 21 17 11	
Calamita	67 41 48 10		Caffer Reg.	132 1 47 1	
Caldy	20 1 51 40		Cataio Reg.	150 1 53 1	
Calecut	112 41 10 29		Catnes	22 5 58 29	
Galice in France	29 10 50 40		Carwicke	41 11 69 11	
Calibia Reg.	42 10 36 20		Chester in Engl.	21 29 53 51	
California	253 0 30 0		Chichester	24 11 51 0	
Gamanor	300 20 16 30 S		Chidlies cape	326 41 67 29	S
Cambaba	150 0 8 10 S		Chily Reg.	305 0 30 1	
Cambaya	110 0 22 0		Chirman Reg.	96 0 26 29	
Gamboya Reg.	142 20 11 40		Cirena	53 29 32 0	
Capiapa	304 50 34 0 S		Cypres	68 4 37 30	

CD	Longit.	Latit.	DE	Longit.	Latit.
Clearmont	30 55	45 51	Derwinda	47 51	57 26
Cocas a mountain	79 0	47 39	Dauenter	33 25	51 51
Coechin	114 0	9 14	Diep	28 41	49 29
Callao Reg.	310 0	16 0 S	Dires cape	321 29	54 51
Colmogory	62 41	63 41	Dominica	319 41	14 0
Colne	34 0	51 41	Donaríuer	75 0	53 21
Commania Reg.	86 0	51 0	Donecz arñuer	71 0	51 0
Congu	147 21	49 11	Dorow	58 0	51 29
Coninxberg	49 11	55 29	Douer	28 11	51 0
Constantinople	61 1	44 40	Dublin	16 41	53 11
Copen hage	38 29	55 51	Dumaran	150 0	8 41
Corasau Reg.	108 1	37 0	Duy	34 29	59 21
Corke ia Ireland	15 41	51 41	Duyhe	56 29	50 29
Corfuán Iland	22 0	39 19	Dams straights	324 1	64 0
Coriath	54 21	39 0	Darby	24 5	52 55
Corsica	38 11	42 0	Dunkerke	29 10	51 12
Corum Reg.	230 0	51 0	E		
Cracow	48 29	50 0	Baida	60 1	25 29
Cuba	296 0	31 41	Edenbrough	22 1	55 51
Earle of Cumber- lands Iscs	316 0	63 21	Ely	25 20	52 40
Cusitan Reg.	87 0	32 0	Elior	26 20	10 10
Conough	15 33	53 45	Queene EliZaberbs forland	337 0	61 30
Cambridge	25 50	52 14	Emden	34 10	53 10
D					
D			Ens	43 0	48 30
Angali Reg.	78 0	11 0	Ens	74 10	37 30
Diu	107 3	20 42	Ephesus	60 30	39 40
Damon	108 8	19 20	Ergas	86 0	8 0
Dabol	109 6	17 45	Euboya	56 13	1 0
Dawina	74 30	62 10	Euphrates	76 40	50 0
Dargeroote	48 41	59 41	Europa Reg.	55 0	51 0
Dalacia	77 0	14 21	Exeter	22 10	50 0
Damascus	74 29	33 0	Enchuisen	21 40	52 54
Danzicke	46 0	55 0	F		
D. Darcies Isle	327 51	68 21	Alsterhood	40 0	56 0
			Famagosta	69 20	57 30

F G	Longit.	Latit.	G	Longit.	Latit.
Carrollones	29 42 0	11 40 S	Garnesey	22 20	49 40
Jargana	11 44 0	46 0	Gaza	70 50	33 10 S
Jarre	16 20	61 30	Gambi	64 40	17 30 S
Cap fatache	86 50	15 40	Gargiza	72 40	12 0 S
Saflo	75 50	45 40	Gemenacota	118 40	6 0
Parnasa	38 10	30 10 S	Genua	33 40	46 20
Fernandobuck	35 14 0	9 20	Genua	37 50	45 0
Fees Reg.	21 50	32 50	Genua	15 20	16 0
Fierro	6 20	26 30	Gerguth Reg.	153 0	57 0
Finmarke	47 0	69 30	Germanarco	40 0	51 0
Flamborough head		20 54 0	Getseluin	24 30	32 20
Flensburg	36 40	55 0	Genera	7 30	26 30
Fleccory	32 0	58 0	Ghir a riuer	25 30	22 0
Flye	32 0	53 33	Giamber	18 1	33 41
Florence	41 10	43 40	Gilberts found	326 51	67 1
Flores Island	35 3 40	39 20	Giras a riuer	41 21	20 11
Florida Reg.	29 2 0	31 0	Galloway	15 49	53 15
Flocen	38 40	46 30	Goa	102 21	15 14
La formanos	31 0 30	60 40	Glosgow	29 0	57 0
Formentera	31 10	38 50	Golfo de benngal	125 0	15 0
Forteuentura	11 0 28	0	Golfo de S. Helen	48 41	33 29 S
Foyle	15 50	55 30	Golfo de la India	44 21	3 14 S
Frailes	31 4 30	11 20	Golfo de los negi	350 30	2 0 S
Franckfort	36 30	50 0	Golfo del Rey	40 41	5 30 S
Friisland	35 1 30	62 0	Golfo de todos	345 30	1 41
Forbishers strait	33 1 20	64 0	Santos		
A furious ouerfall	32 2 30	60 0	Golfo de S. Anto.	46 20	26 0 S
Farre Islands	17 0	62 10	Golfo frio	45 30	20 0 S
Farnill Ile	24 45	60 0	Goteland	45 21	57 30
Ferando	14 6 0	32 35	Gozo	58 20	34 41
G					
Ago Reg.	25 0	8 30	Granda	318 20	11 0
Galathia	37 20	37 0	Granata	23 30	38 0
Gambra a riuer	12 0	13 1	Grecia Reg.	54 0	40 0
Gane	30 20	50 40	Gratiosa	357 30	39 2
Garamantica	51 30	16 0	Groninghem	32 11	53 0
			Groenland	0 0	75 0

GH	Long.	Latit.	I	Longit.	Latit.
Groy	21 0	47 21	I		
Guinea noua	80 0	5 0 S	IAmbic	121 30	1 15 S
Guinea Reg.	18 0	9 0	Iacatra	140 0	6 0 S
Gunagona	67 30	6 0	Iamaica	238 29	72 0 S
Gibraltar straight	21 30	35 0	Iasques in Persia	44 0	25 40
H			Japan	169 0	38 0
Ales Island	337 30	63 0	Iarsey Island	23 0	49 20
Haliber	78 41	21 1	Iaua maior	140 0	9 0
Halicz	52 51	48 41	Iaua minor	151 0	8 0
Hambrough	37 11	53 21	Iazin	77 30	20 30
Hartlepoole	24 0	55 21	Iapara	141 20	7 40
Harwich	37 29	52 0	Ie ico	73 1	33 0
Hauana	292 11	23 0	Ieusalem	72 21	33 0
Hebrides	15 20	58 0	Ilmens a riuer	105 0	27 0
Heidelberg	36 0	49 0	Inaus a moun-	128 0	39 0
Heist	23 29	46 9	taine		
Heishant	19 29	48 41	India Orientall	135 0	26 0
Heptapolis	324 29	25 21	Indus a riuer	115 29	26 50
Hercules pillars	69 21	32 11	Inspurg Islands	40 41	47 9
Helichland	33 51	66 0	The three Islands	169 21	40 20
Hercania Reg.	100 0	40 0	le d'eaus	310 30	11 30
Hispania Reg.	25 0	40 0	le d'eaus	173 50	4 30
Noua Hispania	280 0	13 29	le de bastinado	293 30	10 20
Hispaniola	305 0	18 29	le braua	1 20	12 50
Holindall	36 11	51 1	islas de corales	194 40	9 50
Hontsoort	48 30	59 1	Ille desie to	178 0	37 1
Horne	12 10	66 10	Ille del fuego	22 0	14 21
Hull	25 21	53 41	Ille de los fuegos	181 29	22 41
Hungaria	50 0	48 1	Ille delos Galope-	281 10	4 0
Hidalpes a riuer	124 0	33 21	gos maiores		
Hipasis a riuer	124 0	33 1	Ille delos Galope-	277 30	1 10
H lin head	15 0	55 13	gos minores		
H ieford	12 38	52 12	Ille de Hombres	169 20	5 41
Heel of Danthick	46 10	55 40	blancos		
			Ille de S. Iago	158 20	8 0
			Ille de S. Juan	325 29	42 0

I	Longit.	Latit.	I K L	Longit.	Latit.
Ile de los Ladrones	177 21 15 11		Isebella	305 21 18 51	
Ile de los Lobos	307 41 40 21	S	Island	8 066 0	
Ile de S. Maria	296 29 37 2	S	Italy Reg.	42 29 43 0	
Ile de martin vaz	11 21 21 1		Ireland	16 053 29	
Ile de May	4 29 13 29		Iucatan Reg.	28 30 18 C	
Ile de S. Michael	0 029 29	S	Iugor	138 0 7 50	
Ile de Negros	155 29 10 29	S	Iuica	31 21 39 30	
Island of fowles	33 40 50 0		Ialibella	66 0 1 30	
Ile de Orleance	312 050 29		K		
Ile de Paiaros	314 012 41		Almuchi in Tartaria	9 551 0	
Ile de Palmas	163 21 6 0		Karakithath Reg.	119 051 0	
Ile de Paxaros	198 51 8 51		Casakky Tartaria	103 051 0	
Ile de Paxaros	234 21 18 0		Kithais	110 057 0	
Ile de Pearles	289 1 7 0		Kithay a Lake	123 31 53 0	
Ile de Pinos	292 21 21 29		Kola	54 51 62 0	
Ile de Rees	1 20 25 2		Kolenig	4 11 65 10	
Ile of Salt	5 0 16 29		Kofar a riuer	96 40 49 0	
Salomon Iland	204 40 10 0		Kintale	19 30 56 45	
Ile of the Sunne	342 0 10 29		Kinsaile	15 3 52 35	
Ile S. Thomæ	38 0 0 0		L		
Ile Saint Thomas	252 0 20 11		Acierna	24 50 39 30	
Ile de Verde	353 51 45 29		Ladena	53 30 41 31	
Ile de S. Vincent	175 50 8 0		Ladoga	62 11 61 40	
Ile de S. Vincent	73 21 20 29		Lago delos coro-	295 1 44 0	
Ile de S. Catalina	334 10 27 30	S	nadus		
Ile de S. Cedros	240 30 29 50	S	Lampesa	36 21 23 0	
Ile de farnan laro	354 20 2 20		Lanearocca	11 41 29 30	
Ile delima	295 10 22 0	S	Lanow	51 11 52 20	
Ile secas	46 20 29 30	S	Laredo	22 51 43 0	
Ile de Tristande	26 30 36 0	S	Larifa	70 0 33 0	
Acunia			Larta	53 0 46 0	
Team	135 0 7 29		Lake de Gouleme	306 40 48 0	
Iolofo	24 29 6 0		Lacus armibus	131 0 60 10	
Ipswich	27 12 52 22		Lacus falsus	137 40 47 30	
Joppe	71 21 4 0				

LM	Longit.	Latit.	M	Longit.	Latit.
Leon	21 11	42 15	Macyra an Iland	62 0	19 40
Leon	283 41	11 21	Madera Ilands	8 11	31 29
Leopolis	52 51	49 2	Mæatis palus	71 30	40 29
Lepin	98 0	58 41	Magadaxo	78 0	5 11
Leguio Maior	165 0	28 0	Magalo	71 20	9 29 S
Leguio Minor	158 41	22 0	Maida	2 40	46 40
Lerida	28 21	41 30	Magallanes	305 0	53 25
Lester point	335 0	62 0	straights		90 0
Lima	296 41	23 30	Majorca Iland	31 31	30 0
Limonia	72 11	44 20	Malibrigo	178 51	26 0
Lymosa	43 29	45	Malaca	137 0	3 30
Lions	32 41	45 40	Malaga	23 51	37 21
Liorne	40 21	43 30	Maldanar an Iland	113 0	3 0
Lisboa	17 29	39 11	Malorca	31 31	30 0
Lyzard	18 30	50 10	Malta an Iland	46 0	35 31
Lodom	95 50	51 40	Man an Iland	19 0	44 51
London coast	326 11	72 0	Mosambique	70 0	14 32
Lepeso	74 1	49 41	Mogada	66 34	4 0
Loyer a riuer	24 14	47 41	Mamora	135 0	0 30 S
Longsound	34 30	58 55	Membasa	78 15	3 20
Lubec	38 2	53 51	Mangesia	61 91	41 29
Lucka	42 11	52 0	Mangorca	150 0	37 0
Lucky	64 0	58 21	Manica	62 51	23 29
L. Lumleys Inlet	320 0	61 0	Manicongo Reg.	46 61	5 0
Luna a Mountaine	50 0	16 0	Maniola Iland	30 0	40 0 S
Lundy	19 2	51 0	Merchant Ile	30 0	68 21
Lutzke	34 0	50 21	Mare de bachuor	92 0	45 0
Luzon an Iland	156 0	17 0	the Caspian sea.		
Lybia	33 0	23 30	Mare congelatum	343 0	64 0
Lin	29 2	55 248	Mare de India	120 0	10 0
Lincolne	25 2	55 22	Mare major	68 0	46 0
M			Mare mediterani-	59 0	35 0
Mahoga	64 41	83 30 S	um		
Machian	106 41	0 29	Mare rubrum	75 0	20 0
Machoenta	93 51	33 41	Mare vermeio	255 0	26 0
Macfin Iland	93 30	75 30	Mare delzur	220 10	10 0

M	Longit.	Latit.	M N	Longit.	Latit.
Margarita	314 11	0 50	Memorancie	130 0	47 0
Marigalante	320 0	13 50	Monguill Reg.	160 0	91 30
Marnios	306 21	40 40	Monte de branid	47 11	30 15 S
Maroco	20 0	30 19	Mont frogoso	44 0	12 0
Marcellis	33 51	13 40	Mont negro	44 41	17 0
Matalio	23 29	30 20	Mont raleigh	20 20	65 0
Milford hauen	20 25	51 48	Mont royll	301 0	45 40
Mastagan	30 1	35 2	Morea Reg.	54 30	38 0
Mazaker	167 0	33 0	Molaick	68 50	55 0
Madagascar	757 0	19 5	Mosambique Reg.	70 20	14 40
Maræ apama	312 10	8 0	Mutcouia Reg.	80 0	59 0
Meander a Moun- taine	152 0	31 30	Moskow	70 0	55 40
Malestreme	36 0	67 22	Mossa	84 30	35 0
Meb	46 29	34 40	Mossiull	84 0	34 55
Medina cely	23 29	41 10	Mozena	24 20	34 30
Medina talnaby	37 0	27 20	Moa	96 36	21 31
Manilia	156 0	3 16	Minas	165 0	36 20
Medino	98 29	36 29	Mosceneck	69 50	51 30
Middleburg	29 40	52 0	Munster	35 0	52 10
Meissen	41 0	51 10	N		
Melin de Reg.	71 21	3 20 S	Abarz	79 50	50 50
Melley Reg.	15 41	12 0	Naiman Reg.	140 0	64 0
Meluing	48 1	54 50	Naynen	31 10	50 0
Ments	35 51	50 0	Nantes	24 10	47 50
Meshet	85 29	52 50	Napoly	45 0	41 0
Mesopotamia	78 1	35 0	Napoly	55 10	38 0
Messana	45 51	37 50	Napthaly	73 0	34 30
Metz	33 29	49 45	Narbona	30 20	43 20
Mien Reg.	136 1	31 0	Nardenborg	47 10	57 50
Mienskow	56 41	54 50	Narue	56 10	50 0
Millaine	38 29	46 10	Naruare	21 5	43 39
Minorca Ile	34 26	40 0	Naseph	110 30	43 0
Moldauia Reg.	55 0	46 0	Natolia Reg.	66 0	41 0
Molines	30 21	47 40	Nazareth	72 40	24 10
Mollucca Ilands	160 41	1 0	Newcastle	23 10	53 20
			Nicaria	59 30	39 30

NO	Longit.	Latit.	O.P	Longit.	Latit.
Nicober an Iland	130 30	6 40	Orleans	28 29	48 2
Nicomedia	63 30	44 20	Ormus Ile	93 21	26 29
Nicopolis	56 30	45 0	Orla	59 51	54 21
Niesfot	57 40	59 50	Orfa	41 21	61 29
Nilus a Riuver	67 20	32 0	Orrona	44 29	42 40
Ninus	82 20	37 0	Oronto	49 24	40 21
Nisa	36 10	44 0	Oxenford	26 0	53 0
Nissa	45 30	50 30	Oya Reg.	75 0	13 0
Naze in Norway	31 0	58 5	Ostend	29 29	51 29
Noes a mountain	81 0	40 21	Orenge	30 35	43 35
Nolon	30 0	40 22	Olliance	27 52	47 42
Nombre de dyos	294 29	9 22	Oldsound	31 36	51 35
Norumbega	315 41	43 41	Orfordnes	28 0	52 15
Norweigh	35 0	62 2	P		
Nouogradec	57 11	53 2	Agansa	99 51	45 0 S
Nowgrod	65 29	52 41	Paito	290 30	5 10
Nowgorod	62 51	60 29	Palagosa	47 29	43 0
Nowgorcd	80 2	55 21	Palandura Iland	19 8	11 0
Nubia Reg.	57 2	13 0	Palatia	60 51	39 21
Nubia a River	57 2	15 41	Palma Iland	6 21	28 0 S
Norenberg	39 9	49 29	Palona	105 10	2 0
Norwich	27 15	52 45	Pancer	120 0	41 0
O					
Obya riuver	107 1	50 0	Pambolona	24 29	42 41
Occa a riuver	77 29	55 41	Panama	394 29	8 11
Olant	43 29	57 0	Pantanalia	42 50	36 29
Olleron	24 29	45 29	Panuco	270 11	12 20
Olone	24 29	47 0	Pauia	270 12	12 21
Omagua Reg.	130 1	9 0 S	Patricks purgator	15 55	54 32
Omiba	54 11	66 51	Parris	29 2	48 29
Onega a riuver	56 41	64 0	Parma	39 20	45 11
Onegaburgh	59 29	62 29	Passan	41 50	48 41
Opawkow	64 29	53 29	Paura	37 51	46 11
Orcades Iles	22 11	59 2	Paznalu	155 29	45 51
Orellana	343 11	3 2	Pechora	65 51	67 0
Orixa Reg.	119 1	19 2	Pechora Castle	73 51	64 51
			Pegu	135 0	20 0

P	Longit.	Latit.	P Q	Longit.	Latit.
cim Reg.	132 0	51 29	Port Sallido	186 41	3 0 S
erigo	323 11	43 21	Port sancto	201 0	32 29
ernou	53 29	58 41	Port S. Vincent	337 21	23 51
eru Reg.	236 0	17 0 S	Parga	42 39	50 0
erusia	142 21	43 11	Preslaw	45 11	51 11
Pescara	34 29	30 11	Preslaw	46 41	49 45
Phillippina Island	158 0	15 0	Portland	22 40	50 40
Palimbam	142 40	7 30	Prinsberg	48 30	55 11
Pico	356 41	38 21	Prussia Reg.	50 0	34 6
Piccora Reg.	317 0	10 2 S	Ptolomais	66 41	29 40
Pigmea	148 41	32 2	Punto de S. Helen	290 11	2 11
Pilingu	144 21	40 2	Punto de S. Helen	325 21	37 30
Pina	296 21	3 1	Punt de S. Lucas	152 29	23 29
Pinga	101 40	14 20 S	Priaman	118 0	0 20
Port de los leenes	318 0		Q		
Piramides	173 11	20 21	Vanzu	157 29	44 10
Pisa	40 29	43 41	Quelenfu	158 29	36 1
Pizan	73 0	51 29	Quianfu	144 41	42 20
Plata	315 0	19 51	Quiloa Reg.	69 51	8 51
Plimouth	21 11	50 51	Quinza	153 0	40 1 1
Poosko	48 11	52 41	Quito	293 11	0 11
Plotzko	57 29	57 41	Quiuira	233 0	43 40
Podolia Reg.	59 0	49 29	R		
Poictiers	26 29	47 21	Agusy	40 29	4 1
Poldauid	20 54	47 55	Rameles	68 29	0 30
Polonia Reg.	53 1	50 0 S	Rane	352 41	6 41
Buen Porta	177 21	2 0	Rauenna	42 21	44 21
Port de canoas	239 21	36 41	Rhodes	61 41	37 11
Port de canolas	283 0	14 21	Ryaurech	94 41	40 0
Port de la conce	45 41	4 21	Ribadeo	20 21	43 21
Port de fire	313 0	47 41 S	Riga	53 30	58 0
Port famim	302 51	53 11 S	Reins	30 35	49 12
Port fremo	44 0	4 0 S	Riuers		
Port delgado	42 11	3 51	Rio de arebodelas	331 41	1 41 S
Port de S. Miguell	240 29	25 2	Rio de S. August	350 0	15 3
Port de nigillo	296 51	17 11	Rio de St. Barbara	326 41	34 1

R	Longit.	Latit.	R S	Longit.	Latit.
Rio del Brasill	348 21	17 11	Rye	27 29	51 1
Rio de los camarc- nes	42 0	5 25	Rio de senega	14 25	15 6
Rio de Camaron	315 0	44 39 S	S Abarsa	154 51	45 0
Rio del campo	42 29	3 51	Sablekan Reg.	114 0	34 0
Rio dangla	298 41	33 11	Sabron	84 51	45 11
Rio de Cannon	42 29	0 41	Sacndebar	174 41	35 51
Rio dulce	316 29	52 '0	Sagatin	95 29	58 21
Rio de S. demingo	353 0	7 51	Sala	49 41	48 0
Rio del estremo	340 41	22 59 S	Salamanca	20 29	40 51
Rio de Flores	287 19	29 0 S	Salasta	72 41	41 51
Rio del gado	34 21	6 21	Salina	45 0	38 29
Rio de Gigantes	278 29	29 0	Salsburg	42 0	48 21
Rio grande.	301 11	11 0	Salstrom	32 21	62 0
Rio grande	314 29	44 0	Saluado	321 21	5 0
Rio del guato	284 29	29 29	Samaria	72 21	47 41
Rio de la hacha	304 15	10 41 S	Sandersons Tow.	320 0	55 29
Rio de S. Helena	348 41	10 29	Hope Sanderson	326 31	72 41
S.Laurence Riuer	318 51	53 0 S	Sandry	162 51	53 0
Rio de Manicong	48 21	10 0	Sanson	20 41	43 21
Rio del Oro	10 21	22 29	S.Crux	334 21	43 29
Rio de Palmas	272 11	14 21	S.Dauids	20 0	52 0
Rio panuco	271 51	22 29	S. Dominigo	307 11	17 51
Rio de perla	292 29	29 0	S. George	357 11	39 C
Rio de la plata	326 29	36 0	S.Helena	54 29	13 C
Rio primero	327 41	45 0	Santiago	264 29	20 29 S
Rio sancto	300 29	3 0 S	Santiago	298 11	32 11
Rio de spirito san.	381 29	31 0	S. Iago	175 29	2 0
The white Riuer	308 11	51 21 S	S.Iohn de Luz	25 11	43 21
Rypon	35 29	55 21	S. Lazaro	71 0	11 21 S
Roan	27 41	48 51	S. Lucar	21 21	37 11
Rochell	25 29	46 41	S. Lucia	0 1	17 0
Romey	42 29	42 0	S. Malo	24 21	47 50
Roosewicke	40 21	54 0	S.Maria	82 29	17 0 S
Rostone	72 11	57 0	S. Maria	240 41	34 21
Russia	57 29	59 29	S. Maria	0 39	56 0

S	Longit.	Latit.	S	Longit.	Latit.
Maries	85 1	44 29	Sierraleona	19 8	8 40
Maries of Naza.	66 30	16 29	Skalholt	8 30	65 20
Martha	301 21	10 41	Sibier Reg.	99 20	59 30
Martin	321 11	51 0	Scicillia	45 0	37 30
Martins Islands	293 40	46 51	Sidon	72 10	36 30
Mathewes	21 11	1 51	Siam	140 0	13 49
Michell	60 50	65 29	Sina a mountaine	75 0	20 0
Michael	0 50	38 5	Sinus mexico	280 0	26 0
Miguell	327 21	47 21	Sinus persia	85 0	29 0
Miguell	291 41	9 11	Sion	59 10	12 40
Miguell	368 0	24 0	Sipanto	45 30	41 50
Miguell	249 0	32 51	Siuill	18 6	37 45
Nicolas	69 0	54 0	Slaba	55 50	58 41
Nicolas	323 21	53 41	Slauonia	47 0	45 0
Nicolas	2 2	17 0	Slego in Ireland	15 35	54 15
Petro	64 29	0 29	Slowoda	68 20	64 30
Pol de Lyon	20 41	48 48	Slowoda	86 30	58 51
Samson	306 29	40 29	Smirna	60 21	40 29
Vincent	0 29	17 29	Snauell	2 30	64 21
Vincent	318 41	11 51	Sorlings	18 0	50 0
Sapom Island	107 11	0 29	Spacado	46 50	45 21
Carachi	84 29	44 11	Spier	35 30	49 21
Saragosa	36 11	41 51	Spina	60 50	43 29
Sardinia	39 0	40 0	Stad	30 40	61 41
Stayres Island	174 11	46 30	Stapholt	2 20	65 41
Sauatapoly	75 29	47 21	Stetin	42 10	53 51
Scarborough	34 51	54 51	Stoby	52 30	44 0
Schotland	25 0	60 0	Stocholme	42 0	58 11
Scotland Reg.	20 0	57 0	Straights of Tuma-	74 30	73 11
Segidin	49 0	47 11	chin		
Seames	19 29	48 21	Seuedia Reg.	40 0	60 0
Senega Reg.	13 0	24 0	Sumatra an Iland	134 0	0 0
Serneti Reg.	106 29	33 29	Soor	84 45	23 5
Sabolisher	83 41	56 20	Surrat	99 24	21 7
Shahaskik	91 29	53 9	Swally wad	99 32	21 25
Shrewsbury	22 35	52 55	Saldania bay	29 45	32 40

T S	Longit.	Latit.	T V	Longit.	Latit.
Silly	18 0	5 70	Toures	27 30	47 50
Stert	22 50	50 40	Trent	40 10	26 10
Sweineburnehead	25 0	59 51	Triago an Iland	278 40	21 0
Syria	74 0	39 0	Tribanta	63 30	41 50
Siracusæ	45 41	37 0	Trinidad	355 20	49 10
Southampton	24 5	51 11	Trinidad	295 50	21 20
T			Trinidad	319 20	9 0
Aranto	48 0	40 29	Irynty Arbor	308 30	36 0
Tarapaca	306 21	30 41	Tripolis antiqua	44 21	30 20
Tarbacan	109 29	34 51	Tripolis in Barba.	45 21	30 30
Targa Reg.	32 0	25 0	Tripolis soria	72 21	37 0
Taragona	29 29	40 41	Troyia	59 0	42 30
Tarso	71 21	40 0	Troy	31 0	48 10
Tartar	152 0	63 21	Tuna	41 51	64 30
Tartaria Reg.	130 0	62 0	Turson	131 30	56 30
Tasken Reg.	129 0	49 0	Tyrus	71 35	35 30
Tatracan	55 0	44 51	Tzeroas	79 50	49 20
Tccou	116 29	0 41	Talao	159 0	3 30
Tenariffe	8 11	27 29	Ternate	160 12	0 30
Tendue Reg.	170 0	59 0	Tidore	160 15	0 10
Tenesab	46 41	61 11	Timor	139 12	10 20
Tarceta	358 23	39 0	V		
Terra alta	160 29	6 51	Alentia	29 20	39 41
Terra alta	45 21	15 21	Varcano	107 50	39 0
Ter de los sumos	322 29	40 21	Varon	83 30	70 30
Tharsis	115 21	49 0	Vaygats an Iland	81 30	69 21
Thessalonia	53 44	44 21	Venice	41 40	45 51
Texell in Holland	31 0	53 15	Verma Reg.	133 0	21 30
Thoulouse	28 40	43 50	Varona	40 40	45 50
Thunnis	67 40	32 0	Viana	17 30	42 0
Tygris a Riuer	84 0	34 30	Viatea	87 50	59 30
Tocrors	54 50	46 0	Vienna	45 30	48 30
Togra	146 0	49 50	Villalonga	28 20	7 40
Tolledo	22 20	39 40	Ville conde	17 30	41 30
Tollon	34 5	43 20	Virgithia	302 1	36 0
Toul.	33 10	40 10	Vishgrod	61 30	51 30

V W	Longit.	Latit.	X Y Z	Longit.	Latit.
Bona Vista	4 30	15 30			
Buena Vista	308 4	40 11	X		
Buena Vista	177 30	13 30	X Aques	282 20	20 29
Vim	37 50	48 50			
Volga a riuer	75 40	58 0	Y		
Vpsalia	42 50	60 0			
Vigis a riuer	85 50	53 20	Y Armouth	27 30	53 0
Visting	79 30	61 30	Yorke	23 30	54 29
W		30	Yu gua	303 30	21 0
V V Aersber-	39	1 57 20	Yuchcope	22 56	56 20
ghen			Z		
Wardhouse	50 30	70 26	Z Acana a riuer	6 40	13 0 S
Earle Warwicks	323 11	62 1	Zacatula	296 40	20 0
foreland			Zacotonan Iland	88 0	12 51
Waterford	17 15	52 16	Zama	49 30	14 0 S
Couat Warwick	330 41	64 41	Zama	74 41	11 41
sound			Zeilam	104 0	8 0
Wakefield	23 48	53 45	Zanhage Reg.	20 0	24 0
Wasilgo rode	81 50	56 41	Zanziber	73 52	5 29 5
Waxon	49 20	52 39	Zara	46 25	43 41
Weimouth	23 50	51 0	Zaradrus a riuer	126 0	94 0
Welichy	96 30	56 0	Zauan	41 29	51 0
Wilkipoyassa	161 20	63 39	Zedica	48 0	29 29
Wolitz	63 40	59 51	Zegzeg Reg.	36 41	14 41
Weroy	39 50	68 41	Zoua Zembla	83 29	74 0
Wesel	21 29	51 29	Zinguis	76 11	49 29
Westerhold	40 29	67 41	Zoidalanell	137 31	3 51
Whitbay	24 26	55 0	Zuenziga Reg.	25 0	25 0
Wiborough	56 29	62 35			
White Ile	25 11	50 39			
Sr. Hugh Willaby	60 0	72 0			
Iland					
Winterton	27 20	53 29	FINIS		
Wologda	73 50	59 20			
Wologda	74 30	60 0			

